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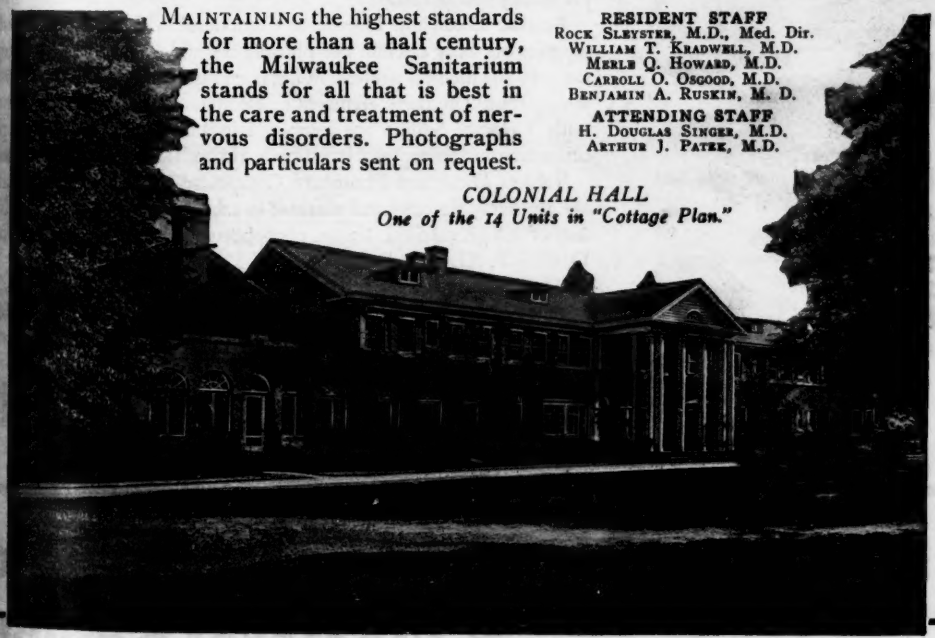

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Editorial

THE MEDICAL PROFESSION RESENTS UNTRUE ACCUSATIONS

Socialistic propagandists have provoked much resentment through the accusation that with medical men the economics of the service is paramount to the service itself.

A British poet laureate wrote decades since

"A lie that is all a lie may be met and fought with outright.
A lie that is half a truth is a harder matter to fight."

Both varieties of lie enter into all this argument about science and economics.

At the outset it is manifestly false that:

1. A man, a woman or their family, either as individuals or as a civic unit are ever refused medical attention because of inability to pay. As a matter of fact such unfortunates receive medical care without cost and of a far better quality than they receive gratis for any of the other necessities of life such as food, shelter, clothing, heat or sanitary conveniences.

2. That the medical profession employs one method of treatment for the rich; *almost* its equal for *very poor,* the patients enjoying the patronage of the plutocrats in subsidized hospitals or foundation sponsored clinics, and *very inferior methods* for the economically squeezed "white collar class," too self-respecting to be healed as "the poor and destitute" and too financially involved to assume the prerogatives of "the rich."

3. That all physicians are rolling in wealth and that to be a doctor is to be a self-coining mint.

4. That doctors never have any personal ailments nor obligations; that their families are orchidaceous and can secure food, clothing, lodging, education and other sine-qua-non's of existence merely by having father pick up his hat and twist his fingers and cry aloud "Abracadabra, hocus pocus, Little table set yourself."

5. That a doctor can spend some eight years

in specialized preparation to practice medicine and that when he has come forth from accepted medical colleges and "hung out his shingle" he knows far less about his chosen profession than the man who has been busied all these years by coining money hand over fist through the pursuit of the manufacture of shoes, or extra fine cheeses, or rayon underwear.

6. That, even if a doctor is skilled in surgery, "bone-setting," diagnosis, therapeutics or other scientific skullduggery he is as the least of all the Mongolian idiots when it comes to such simple matters of another ilk as adding up two and two and getting four for an answer.

7. That, even if a doctor does not partake of political graft and jugglery, he is such an ingrained nincompoop that he does not know what it is all about.

8. That scientific medicine is a virginal field pleading for exploitation as a center for the experimental processes based upon the concept that medicine is a commodity available for mass purchase and for job lot distribution, and that until big business discovered medicine the science was as yet barely more than a stillborn child.

9. That medicine's Moses lies in Communism. That the way out to the promised land for both profession and public lies through the road of lay control—political, foundation and endowment.

10. That physicians overcharge and that the bulk of sickness expense goes to the physician with a complete disregard of the overwhelming overhead which is distributed among hospitals, nurses, etc.

11. That the doctor never does any charity whereas taking into account the proportion of a physician's accounts receivable that are collectible the average physician does a business of which approximately only 50 per cent is ever collected, while the recognized charity work of any doctor is easily from one-third to one-half of his practice.

12. That "health insurance" gives a patient as good medical service or even better than is available under the present plan of independent service and that the "panel doctor" earns enough from his panel work to keep body and soul together let alone to permit himself to keep step with the ever progressing science of medicine.

13. That by increased taxation and with a group of political appointees to run the medical profession, sickness and deformity will magically disappear from the nation.

14. That such socialized health service will cost United States citizens less than they pay now for the best medical care in the world.

As to the "half-truths" the profession itself is compelled to realize that:

1. The present system of the scientific administration of scientific medicine must have poignant re-draughting of its general scheme.

2. Better distribution of physicians is demanded.

3. Abridgement of training time must be accomplished in some way.

4. Group practice, if accepted, must be at the discretion and under domination of the profession itself.

5. Part pay clinics, hospitals, corporations and foundations practicing medicine may temporarily lessen the cost to a certain few patients but in the end this lay interference really wrecks the morale, the structure and the efficiency of the legitimate practice of medicine.

ILLINOIS SUPREME COURT HOLDS THAT A CORPORATION CANNOT PRACTICE MEDICINE

At the February, 1936, term of the Illinois Supreme Court there was handed down a unanimous decision to the effect that a corporation cannot practice medicine in this state.

The case on which this decision was based was an appeal from a clear cut opinion given by Judge Michael L. McKinley of the Superior Court of Cook County and whose decision of April, 1935, has just been confirmed by the Supreme Court of this State.

Below we publish the decision in full.

Docket No. 23169—Agenda 48—October, 1935.

The People of the State of Illinois, by Otto Kerner, Attorney General, Appellee, v. The United Medical Service, Inc., Appellant.

MR. JUSTICE WILSON delivered the opinion of the court:

The Attorney General of the State of his own accord filed a verified petition in the superior court of Cook County for leave to file an information in the nature of a *quo warranto* to require United Medical Service, Inc., a domestic corporation, to show by what warrant it holds a franchise to practice medicine or any of its branches or any system of treating human ailments. The permission sought was granted, and an information containing the same allegations as the petition was filed. Thereafter the respondent moved to

vacate the order and to strike the information on the ground that it was filed in violation of section 8 of the Quo Warranto act. The motion was allowed and the respondent was ordered to plead answer or demur to the petition instead of to the information. The respondent filed nine pleas to the petition and a single replication was filed to the pleas. General and special demurrers were interposed to eight of the replications. In lieu of settling the pleadings and proceeding to a trial the parties elected to present an agreed case conforably to Rule 48 of this court and stipulated the facts. The statement of the agreed case presented to the trial court consisted of the stipulation of facts and of thirteen questions of law. After an extended hearing the court found the respondent guilty as charged and rendered judgment of ouster against it. From that judgment the respondent prosecutes this appeal.

The respondent was incorporated as a corporation for profit on December 15, 1930, with an authorized capital of 400 shares of common stock, having a par value of $100 per share. Although its statement of incorporation enumerates seven objects for which it was formed, the pursuit of only one is assailed in this case, namely, the promotion of individual and public health through the study, prevention and treatment of disease.

The agreed statement of facts shows that in 1933 the respondent established in Chicago a clinic, designed and denominated by it as a fixed-fee, low-cost medical service, with fully equipped offices to provide for the examination and treatment of all physical and mental ailments; that since 1933 it has continuously maintained the clinic and offices, and that all medical and surgical services which the respondent offers are rendered solely by physicians and surgeons licensed and registered by the State of Illinois. It also appears that on several occasions since 1933 the respondent has published announcements of its character and purpose in the form of paid advertisements in the public press, one of which states that the corporation itself is not a charity, nor is it associated with or supported by any charity, philanthropic, educational or tax-supported organization, and affirmatively declares that it is organized for profit. Charges for specific medical services, such as examinations of the heart, the lungs, the eyes, ears, nose and throat, and four other so-called regional examinations, laboratory examinations and X-ray examinations, are set forth in the advertisement. With respect to the medical staff this advertisement announces: "All essential medical service in general health and diagnostic examinations and treatment will be rendered to patients by competent physicians trained and experienced in their respective fields of medicine and registered under the laws of the State of Illinois." Persons seeking and receiving examinations and treatments in and through the clinic enter into contracts with the respondent, and the latter receives the fees for such services and pays the physicians and surgeons in its employ their remuneration. The corporation itself has never applied for or received a license to practice medicine in Illinois.

The respondent contends that the trial court lacked jurisdiction to enter a judgment of ouster because the record contains neither an order granting leave to file an information nor an information. The record in the present case discloses that the information filed pursuant to leave granted was stricken upon the respondent's motion, which specifically charged that the proceeding did not conform to section 8 of the Quo Warranto act. Section 1 of this statute, (Ill. State Bar. Stat. 1935, p. 2518; Smith's Stat. 1935, p. 2569); so far as pertinent to this inquiry, provides that in case any domestic corporation exercises powers not conferred by law, the Attorney General, or State's attorney of the proper county, either of his own accord or at the instance of any individual relator, may present a petition to any court of record of competent jurisdiction for leave to file an information in the nature of a *quo warranto* in the name of the People of the State of Illinois, and that if such court shall be satisfied that there is probably ground for the proceeding it may grant the petition and order the information to be filed and process to issue. Section 8, approved July 6, 1933 (Laws of 1933, p. 856), and in force when this action was instituted, declares that it shall be unnecessary hereafter in any action of quo warranto to set out the cause of action in the writ but that it shall be sufficient to summon the defendant in a summons in the usual form, commanding him to appear and answer the plaintiff in an action of quo warranto, and that the issue shall be made up by answering, pleading or demurring to the petition as in other cases. This section was taken from, and its language is identical with, section 15 of the Practice act of 1907 to the extent that the latter relates to quo warranto proceedings. (Cahill's Stat. 1931, p. 2173; Smith's Stat. 1931, p. 2194.) Section 15 was exactly the same as section 10 of the Practice act of 1872 and was in force when the Quo Warranto act was revised in 1874. The new section of the Quo Warranto act deals only with the form of summons and the manner in which the issues shall be made up. It does not conflict with any of the preceding sections of the statute but is in entire harmony therewith. People v. Moeckel, 256 Ill. 598.

The respondent, in its motion to strike the information, did not charge that probable ground for the proceeding was wanting. Following the entry of the order striking the information the responded pleaded to the petition, which charged that by means of its corporate franchise the respondent had unlawfully usurped the franchise of engaging in the practice of medicine and in the diagnosis and treatment of the diseases of human beings as governed by the Medical Practice act. The petition and the information in this particular proceeding contain identical allegations and make the same charges. Furthermore, the parties entered into a stipulation by which they submitted an agreed case to the trial court, as provided for by the Civil Practice act and Rule 48 of this court. They expressly stated that the agreed case contained the points of law at issue between them, and that "the court shall decide thereon and shall render judgment therein, according as the rights of the said parties in law may appear." An examination of the "statement of agreed case" shows that the respondent did not raise the question of whether the filing of an information was prerequisite to the

rendition of the judgment of ouster against it. While jurisdiction of the subject matter cannot be waived, the method of acquiring jurisdiction of a particular case and irregularities in respect thereto may be waived. The defendant, in a case in which the court has general jurisdiction, may dispense with process altogether, waive irregular process and appear. (Wilson Bros. v. Haege, 347 Ill. 140; Brown v. VanKeuren, 340 id. 118.) The respondent is not in a position to challenge the method of making up the issues, as it induced and acquiesced in the procedure which it now attacks.

The next contention is that sections 8, 82, 83, 84 and 85 of the Business Corporation act deprived the trial court of jurisdiction to determine the issue made up in a quo warranto action under the provisions of the Quo Warranto act. Section 148 of the Corporation act in effect prior to July 13, 1933 (Cahill's Stat. 1931, p. 756; Smith's Stat. 1931, p. 767); provided that when any domestic corporation, under color of any of the powers granted by the statute, committed any act in excess of such powers, such act should be voidable at the instance of the Attorney General, in a direct proceeding in the nature of a quo warranto instituted by him against the offending corporation. Section 1 of the Quo Warranto act was also in force, and provided, among other things, that when any domestic corporation (1) did or omitted any act which amounted to a surrender or forfeiture of its rights and privileges as a corporation, or (2) exercised powers not conferred by law, the Attorney General, or State's attorney of the proper county, either of his own accord or at the instance of any individual relator, should commence quo warranto proceedings. By Section 6, it was further provided that if the corporation should be deemed guilty the court might give judgment of ouster against the corporation from the franchise. The section also provided that instead of judgment of ouster from a franchise for an abuse thereof, unless the court is of the opinion that the public good demands such judgment, the court may fine the corporation found guilty in any sum not exceeding $25,000 for each offense.

The Business Corporation act effective July 13, 1933, expressly repealed the Corporation act of 1919 as amended. The new Corporation law contains no provision for a quo warranto action, nor does it purport to repeal the portion of section 1 of the Quo Warranto act under which this action was brought. The respondent argues, however, that since the Business Corporation act is complete in itself, governing the whole field of corporations for profit, and expressly repealing the Corporation act of 1919, it also repealed by implication, all other existing statutes to the extent that they were inconsistent with the latter statute. Specifically, the respondent asserts that section 1 of the Quo Warranto act, to the extent that it provides a remedy in an action of quo warranto for the exercise of powers not conferred by law, has been abrogated by sections 8, 82, 83, 84 and 85 of the Business Corporation act. Section 8 (Ill. State Bar Stat. 1935, p. 850; Smith's Stat. 1935, p. 809) relates to the defense of ultra vires. It provides, in part, that no limitation upon the business, purposes or powers of a corporation shall be asserted in order to defeat any action at law or in equity between the corporation and a third person, or between a shareholder and a third person, involving any contract to which the corporation is a party, or any right of property or any alleged liability of whatsoever nature, but such limitation may be asserted, "(c) in a proceeding by the State, as provided in this act, to dissolve the corporation, or in a proceeding by the State to enjoin the corporation from the transaction of unauthorized business." Subdivision (c) of section 8 refers to and is controlled and limited by the qualifying language set forth. The remedy by injunction to restrain the corporation from the transaction of unauthorized business is not applicable, because the present case is not one "at law or in equity between the corporation and a third person or between a shareholder and a third person involving any contract to which the corporation is a party or any right or property or any alleged liability of whatsoever nature." Recourse to section 82, 83, 84 and 85 of the Business Corporation act cannot avail the respondent, as those sections purport to relate solely to, and by their express provisions deal with, involuntary dissolution and receivership. Section 82 provides, in part, that a corporation may be dissolved involuntarily by a decree of a court of equity, upon information filed by the Attorney General, when it is made to appear to the court that "(c) the corporation has continued to exceed or abuse the authority conferred upon it by law, or has continued to violate any section or sections of the Criminal Code of the State of Illinois after a written demand to discontinue the same shall have been delivered by the Secretary of State to such corporation." Sections 82 and 83 are declaratory of the common law right of the sovereign to dissolve corporations which violate its laws. (People v. Blue Rose Oil Co. 360 Ill. 397.) The relator concedes that the respondent is lawfully empowered to pursue some of its expressed objects, and this action is directed against only one of its activities, namely, the treatment of disease as a business, for monetary gain. The Attorney General does not seek to dissolve the corporation nor to place it in receivership. The facts do not bring the case within the contemplation of the express provisions of the Business Corporation Act.

In support of its contention the respondent, however, invokes the familiar canon of statutory construction, that the revision of a subject by a later statute evinces a legislative intention to substitute its provisions for the earlier law upon the same subject. (People v. Gould, 345 Ill. 288; Village of Atwood vs. Cincinnati, Indianapolis and Western Railroad Co., 316 id. 425.) It is equally well established that the repeal of laws by implication is not favored, and it is only where there is a clear repugnance between two laws and the provisions of both cannot be carried into effect that the later law will prevail and the earlier one be considered repealed by implication. (People v. West Englewood Bank, 353 Ill. 451; Galpin v. City of Chicago, 249 id. 554.) Where two statutes successively enacted, with relation to the same subject, are seemingly repugnant, it is the duty of the courts so to construe them, if possible that the subsequent act will

not repeal the antecedent one by implication, and, if two constructions are possible, that one will be adopted which operates to support rather than to repeal the earlier act by implication. Walgreen Co. v. Industrial Com. 323 Ill. 194; Village of Glencoe v. Hurford, 317 id. 203; People v. Burke, 313 id. 576.

It may be conceded, as the respondent insists, that sections 82, 83, 84 and 85 of the Business Corporation act of 1933 are the counterpart, among others, of section 148 of the earlier act. This concession, however, cannot avail the respondent, for it does not follow that section I of the Quo Warranto act, concerned, in part, with the corporate exercise of powers unlawfully conferred, is superseded by the sections of the Business Corporation act which provide for the involuntary dissolution and receivership of corporations by informations in equity. There is no inconsistency of repugnance in the language of the statutes, since the Quo Warranto act expressly provides for quo warranto proceedings where a corporation exercises powers not conferred by law. This the Business Corporation act does not prescribe. Had the General Assembly intended to repeal any part of section I of the Quo Warranto act it would undoubtedly have employed appropriate language to accomplish that purpose.

Complaint is made that the legal remedy of quo warranto was not available to the Attorney General in this cause because adequate remedies obtain under the general equity powers of the court and under the express provisions of the Medical Practice act. Upon the basis of the agreed facts the relator maintains that the respondent corporation is engaged in the treatment of disease for profit—a power not conferred upon it by law. It is true that one of the corporate objects found in the certificate of incorporation is the prevention and treatment of disease for profit. Whether the certificate of incorporation, however, confers such rights and powers as are authorized is a matter for judicial determination. When a corporation for profit is formed under the general act, the law, and not the statement or the certificate, must determine what powers can be exercised. (People v. Chicago Gas Trust Co.) 130 Ill. 268. The relator charges in the present case that there has been a usurpation or unlawful assumption of a franchise by the respondent. A corporate franchise proceeds from the sovereign power, and the people have the right at all times to inquire into the title by which such a franchise is claimed or exercised and to have a judgment of ouster if the franchise was improperly granted. (People v. Larsen, 265 Ill. 406.) The only relief sought and obtained in this case was the ouster of the corporation from the assumption and usurpation of a franchise charged to have been improperly granted to it. This improper grant of power is being used, it is charged, in violation of the Medical Practice act. Quo warranto therefore properly lies. High on Extraordinary Remedies, (3rd ed.) sec. 627; 22 R. C. L. p. 682; People v. Ridgely, 21 Ill. 65.

It is also claimed that the provisions of the Medical Practice act afford a proper remedy for prosecuting the respondent. Section 24 of the statute (Ill. State Bar Stat. 1935, p. 2055; Smith's Stat. 1935, p. 2047) provides: "If any person shall hold himself out to the public as being engaged on the diagnosis or treatment of ailments of human beings * * * and shall not then possess in full force and virtue a valid license issued by the authority of this State to practice the treatment of human ailments in any manner, he shall be guilty of a misdemeanor," and subject to punishment by fine of not less than $100 nor more than $500, or by confinement in the county jail for not more than one year, or both fine and imprisonment, in the discretion of the court. From the express language of the statute, it is apparent that the penalties prescribed are directed against individuals practicing medicine without licenses. The punishment by incarceration provided by the Medical Practice act is not applicable to corporations practicing medicine and is obviously directed against individuals. Under the statute the maximum fine fixed for a violation of the provisions against practicing medicine without a license is $500. If section 24 applies to both corporations and individuals the only method of punishing a corporation is by fine. On the other hand, when a judgment is entered under the Quo Warranto act for the exercise of power illegally granted it is that of ouster, or, in the discretion of the court, a maximum fine of $25,000. Under the circumstances of this case it is clear that section 24 of the Medical Practice act does not afford an adequate remedy and would not prevent recurrences of the unlawful exercise of a power improperly conferred upon corporations such as the respondent. Furthermore, the present proceeding is not a criminal proceeding and criminal conduct is not charged. While a proceeding by information in the nature of a quo warranto is a substitute for the ancient writ and retains the character of a criminal prosecution to the extent that the proceeding is in the name of the people and criminal in form, it is a civil remedy calling upon the defendant to show by what warrant a franchise or privilege is exercised. (People v. Barber, 289 Ill. 556; People v. Drainage Comrs. 282 id. 514; Independent Medical College v. People 182 id. 274.) The precise question presented here, whether a corporation may lawfully engage in the practice or treatment of human ailments and the treatment of disease, as a business, is not a criminal question.

The respondent next contends that since section 2 of the Medical Practice act does not state what act or acts may be regarded as constituting the practice of a system or method of treating human ailments, jurisdiction to render the judgment of ouster was wanting. The title of the statute is, "An act to revise the law in relation to the practice of the treatment of human ailments for the better protection of the public health and to prescribe penalties for the violation hereof." Section 2 provides that no unlicensed person shall practice medicine or any of its branches, or midwifery, or any system or method of treating human ailments without the use of drugs or medicine and without operative surgery. The third section prohibits the issuance of a license to any person unless he passes an examination of the qualifications therefor by and satisfactory to the Department of Registration and Education. The next section declares that each applicant for such examination shall,

among other things, submit evidence under oath satisfactory to the department that he has attained the age of twenty-one years, that he is of good moral character, and that he has the preliminary and professional education required by the Medical Practice act. Section 5 fixes minimum standards of professional education to be enforced by the department in conducting examinations and issuing licenses. Section 24 specifically prohibits the performance of certain acts unless a license has been issued, namely, the diagnosis and treatment of ailments of human beings; the prescription of a form of treatment for the palliation of physical ailments of persons with the intention of receiving compensation therefor; and the maintenance of an office for the examination and treatment of persons afflicted or supposed to be afflicted by any ailment.

The title of the Medical Practice act is broad enough to include not only the practice of medicine in all its branches but also the limited treatment of human ailments without drugs or medicine. The legislative intent manifest from a view of the entire law is that only individuals may obtain a license thereunder. No corporation can meet the requirements of the statute essential to the issuance of a license. From the stipulated facts it appears that the respondent has been engaged in the pursuit of activities which under section 24 it could not pursue without a license. It is clear that the respondent, owing to its corporate character, can not obtain a license to engage in the practice of medicine. The mere fact that in a criminal prosecution of an individual for a violation of the Medical Practice act it is necessary to specifically charge in the indictment the act or acts which compose the offense of practicing a system or method of treating human ailments without a license (People v. Brown, 336 Ill. 257) cannot avail the respondent in this case as it is not charged with the commission of a criminal offense. Whether the statute expressly defines what constitutes the practice of a system or method of treating human ailments is therefore immaterial in the present proceeding.

The respondent corporation earnestly contends that the ownership of a clinic, with offices where the treatment of disease is engaged in solely by licensed and registered physicians and surgeons who are employed by the corporation which receives the fee charged the patients, does not constitute the practice of medicine by the corporation. The respondent argues that the fact that the contract of payment for the medical services to be rendered is made between the corporation and the patient does not change the professional relationship between the patient and the various licensed and registered practitioners who treat him in the corporation's office. To support its contention the respondent places reliance upon State v. Brown, 37 Wash. 97, in which the statute attacked required an examination and license in order to "own, * * * run or manage" a dental office. The decision that this statute was void, and also the decisions in State Electro-Medical Institute v. Platner, 74 Neb. 23, and State Electro-Medical Institute v. State, 74 id. 40, cited by the respondent, are contrary not only to the views of this court expressed in Winberry v. Hallihan, 361 Ill. 121, Dr. Allison, Dentist, v. Allison, 360 id. 638, and People v. Peoples Stock Yards Bank, 344 id. 462, but also to the weight of authority. (People vs. Woodbury Dermatological Institute, 192 N. Y. 454; State v. Bailey Dental Co. 211 Iowa, 781; People v. Painless Parker, Dentist, 85 Colo. 304; Parker v. Board of Dental Examiners, 216 Cal. 285.) In the recent case of Dr. Allison, Dentist, v. Allison, supra, this court observed that the practice of a profession is subject to licensing and regulation and is not subject to commercialization or exploitation. "To practice a profession," the court said, "requires something more than the financial ability to hire competent persons to do the actual work. It can be done only by a duly qualified human being, and to qualify something more than mere knowledge or skill is essential. * * * No corporation can qualify."

Our attention is directed to the fact that no provision of the Business Corporation act, or of any other statute of this State, prohibits a corporation organized for profit from rendering any and all medical services by duly licensed and registered physicians and surgeons. The misuse of power sought to be coerced in this case is a right and privilege which individuals, only may obtain by compliance with the provisions of the Medical Practice act. It is true that both section 2 of the Corporation act of 1919 as amended and section 3 of the Business Corporation act provide, with certain named exceptions not material in this case, that corporations for profit may be organized for any lawful purpose. Manifestly, the Business Corporation act, in authorizing the formation of corporations for "any lawful purpose," does not purport to include the practice of the learned professions, such as medicine and law.

The final contention of the respondent corporation which requires consideration is, that in so far as the Medical Practice act prohibits it from practicing medicine by employing licensed physicians and surgeons to that end, the act is an unreasonable exercise of the police power and transcends the due process of law clauses of sections 2 and 14 of article 2 of the constitution of this State and the first section of the fourteenth amendment to the Federal constitution. The police power of the State includes the power to enact comprehensive, detailed and rigid regulations for the practice of medicine, surgery and dentistry. (Douglas v. Noble, 261 U. S. 165; Dent v. West Virginia, 129 id. 114; People v. Witte, 315 Ill. 282.) There is no right to practice medicine which is not subordinate to the police power. (Lambert v. Yellowley, 272 U. S. 581; People v. Walsh, 346 Ill. 52.) The Medical Practice act of 1923 recognizes the different methods of treating human ailments and prescribes reasonable and uniform regulations for testing the qualifications of persons who desire to practice medicine in all its branches and persons who desire to practice some limited form of treating human ailments. People v. Walder, 317 Ill. 524; People v. Witte, supra.

Reliance is placed, however, on Liggett Co. v. Baldridge, 278 U. S. 105, a case involving the validity of a statute of the commonwealth of Pennsylvania which provided that every pharmacy or drug store should be owned only by a licensed pharmacist, and that no cor-

poration, association or copartnership should own one unless all the members or partners were licensed pharmacists. The State Board of Pharmacy refused to grant the Liggett Company a permit to carry on its business on the ground that all of the stockholders of the corporation were not pharmacists. It appears that the corporation was conducting an ordinary business—namely, the operation of a drug store—and that it neither engaged in nor assumed to practice a profession. The United States Supreme Court, in holding the act invalid, observed that mere stock ownership in a corporation owning and operating a drug store could have no real or substantial relation to the public health, and that the statute was, accordingly, an unreasonable and unnecessary restriction upon private business. The Pennsylvania act did not purport to deal with the requirements for engaging in a profession. It does not follow that because a person may have a constitutional property right to operate a drug store he has a like absolute right to engage in the practice of professions such as medicine, dentistry or law. Neither a natural person nor an intangible entity can complain if unable to fulfill the requirements reasonably prerequisite to obtaining a license to engage in a particular profession. Manifestly, the case of Liggett Co. v. Baldridge, supra, is not parallel with the case at bar. We find nothing in that case which conflicts with the well-established rule that the State may deny to corporations the right to practice professions and insist upon the personal obligations of individual practitioners. Semler v. Dental Examiners, 294 U. S. 608; Winberry v. Hallihan, supra; People v. Peoples Stock Yards Bank, supra; People v. Painless Parker, Dentist, supra; Parker v. Board of Dental Examiners, supra.

The judgment of the superior court is right, and it is therefore affirmed.

JUDGMENT AFFIRMED.

RESULTS AND DANGERS IN TREATMENT OF AMEBIASIS: SUMMARY OF FIFTEEN YEARS' CLINICAL EXPERIENCE AT THE MAYO CLINIC

In Philip W. Brown's Rochester, Minn. (*Journal A. M. A.*, Oct. 26, 1935), review of the results of the treatment of amebiasis during the last fifteen years, 278 of the 834 patients (33 per cent) had evidence of active amebiasis on admission, 424 (50 per cent) had intermittent diarrhea associated with various abdominal complaints, some of which were and some of which were not improved by antiamebic treatment, and 132 (16 per cent) were considered as having latent amebiasis. In the latent group were listed fifty-one patients with chronic ulcerative colitis, in all of whom colitis had persisted after antiamebic treatment. Of the 834 cases, 523 afforded sufficient data to warrant tentative conclusions as to the results of treatment. The primary results of treatment with the organic arsenicals is much better than with emetine or ipecac. Failure to obtain a cure, in addition to the occasional reaction, in only 9 to 15 per cent of cases, is most encouraging although still not at the desired goal. Too few results are available on the efficacy of the oxygenated quinolines. The high percentage of failures with alkaloids and the much better results with the arsenicals suggested the value of combining emetine and an arsenical, the former to be used only in sufficient dosage to control acute symptoms, thereby keeping well below even a minimal danger of poisoning, and the latter to be used in smaller doses and yet prove effective in eradicating the amebas. The results confirmed this opinion, for in 150 cases there were eighteen primary failures, or 12 per cent, on treatment at the clinic. Ten of these patients were later cured, leaving eight regarding whom no further data were available. The final results were that treatment failed in 5.3 per cent and was successful in 94.7 per cent of the cases. Of the 125 patients whose original treatment failed, sixty were later cured; twelve persisted with the disease in spite of continued treatment, and for fifty-three no further data were available. With present knowledge, the "reclaiming of failures" lies in a systematic and conservative variation in the treatment. If failure has followed the use of emetine and treparsol, success is unlikely to follow their continued administration; likewise, the possibility of drug reaction increases. Two or three courses of chiniofon are prescribed (21 Gm. a week, with a week's interval between courses). If amebas persist, six weekly injections of arsphenamine or bismuth emetine iodide, with large doses of bismuth subcarbonate, are employed. In other words, varying the ammunition minimizes reactions to the drugs and seems more effective in finally obtaining a cure. As the author reviews the sixty cases finally considered as cured, the barrage of arsphenamine, emetine, bismuth emetine iodide, chiniofon, carbarsone, acetarsone, treparsol, vioform and ipecac is indeed startling, and he asks what good any one drug is when such a variety is used. In any event, a cure was eventually obtained.

STIMULATION OF MAMMARY GLAND DEVELOPMENT

C. K. Weicher, Cincinnati, compared the mammary glands of pregnant rats fed 0.5 Gm. of desiccated thyroid daily, beginning with the first day of pregnancy with normal controls. Although some stimulation of the mammary gland is recognized in the animals fed thyroid even on the fifth day of pregnancy, an extraordinary increase of mammary tissue occurs between the seventh and ninth days. From the ninth day until the end of pregnancy the series of animals fed thyroid showed a marked difference not only in the amount of mammary tissue but in the earlier appearance of secretion in the alveoli. The authors suggest that under conditions of heightened metabolism resulting from thyroid feeding the normal estrin level may be lowered, thus removing the inhibitory effect of the estrin on the hypophysis, at least to a degree. That organ may thus elaborate its hormones to a greater extent than normal. The corpus luteum and hypophyseal hormones are therefore in all probability present in relatively greater concentrations than in the normal animal, the mammary glands responding to the altered conditions by exceptionally rapid development.

SUGGESTIONS ON PREPARING COPY

Writing a Craft and an Art

"It is a craft when practiced for the uses of daily life by persons of ordinary endowments; it is transformed into an art when to excellence of craftsmanship is added the formative principle that differentiates an art from a craft.

"It might be supposed that anyone who wished to write would know what he wished to write about. But many merely wish to write. To recommend that such a person choose a subject which he knows well is not so superfluous as it seems."

A Manual for Writers: Manley and Powers

"Accurate use of a large vocabulary of words clear and sharp in their meaning marks the scholarly writer."

The Writing of Medical Papers: Mellish

A medical editor welcomes copy on new discoveries or novel applications of old principles when presented in attractive form. It therefore behooves the writer to limit his subject closely, to take time to condense and polish the text, verify the statistics, illustrations and tabular matter and present his ideas in a form to appeal to the reader.

Medical literature is accumulating at such an enormous rate that it is comparable to the astronomer's theory of the "Expanding Universe." To add to the mass, unless the contribution is novel and well presented, is a liability rather than an asset.

Following the publication of "Observations on Copy" last year there was some improvement in the papers prepared for the annual meeting and the suggestions are revised and repeated at this time in the hope that they may be useful in the preparation of papers for the forthcoming meeting.

Much time, labor and expense on the part of writers, editors, printers and others can be saved by compliance with these suggestions.

Titles of articles should be brief and explicit. Otherwise they cannot be readily located in the Index Medicus and the author loses the advantage of that excellent publicity.

Paper and Style: All copy should be submitted on standard size white paper, 8½x11 inches and *double spaced throughout.* Page to be blank 1½ inch top and left side; inch on bottom and right side. *Copy to be original.* (Author keeps a carbon copy.)

Pages Numbered: All pages including tables, legends and bibliography, to be numbered consecutively. Also all illustrations to be numbered and marked "top" and have author's name on back.

Title, author: Title of paper, author's name and city address should appear in order stated at top of first page; author's street address at end of article.

The contents of paper should be in the best possible style and turned over to the official reporter with the distinct understanding that proof will be submitted to authors for the correction of *typographical errors only.* If changes from copy are desired they will be made at *author's expense.*

Spelling: Spelling as in Stedman's Medical Dictionary is considered standard. He does not recognize such barbarisms as oedema which he calls "variant," nor have we adopted the short form of though, thorough, etc., even if some lexicographers have.

Abbreviations not in dictionaries should not be used except in tables with explanatory footnotes.

Words Often Misspelled

Abscess
anemia
anastomosis
anesthesia
benefited
bactericidal
calcareous
carcinoma
caseous
desiccate
diphtheria
dyspnea
edema
esophagus
goiter
hemorrhage
Hippocratic
inflamed
inflammation
inoculation
myxedema
per cent. (2 words with period)
preventive
septicemia
smallpox
syphilis
thorough
though
through
tonsillitis
tryparsamide
x-ray

Numbers under 10 to be spelled out; over 10, use Arabic numerals.

Compound Words: Many medical terms formerly written separately or hyphenated are now run together as in German, which has a certain scientific advantage however cacaphonous the sound. Recent editions of both Dorland and Stedman have pharyngomaxillary and sternocleidomastoid which were formerly hyphenated.

Stedman writes all gastro compounds without hyphens. Funk & Wagnall's Standard uses hyphens, indicating that medical practice follows the German style more closely.

Capitalization: No capitals unless proper name or beginning a sentence: thus doctor, physician, dentist, pediatrician.

Names of diseases and medicines not capitalized unless named for a *person.*

X-ray not capitalized unless beginning a sentence.

Titles of articles when referred to *in the article* are not capitalized, or if capitalized should be in quotes.

Illustrations: All cuts required for illustration are furnished at *author's expense.* Clear photographs and wash drawings can be reproduced in halftone cuts; line drawings in zinc etchings. Minimum size halftones cost about $4 each; minimum etchings about $3. *Negatives* of radiograms, either glass or film, are not acceptable; *prints* should be submitted.

Bibliography: References to literature should appear in numerical order in the text and the bibliography should be collected at end of article with the same numbered references. It is rarely necessary to write names of medical journals in full. (J. A. M. A.)

Since 1927 the Index Medicus has maintained a uniform standard of references which answers every requirement of brevity, uniformity and accuracy that makes it the supreme arbiter in this field. This system was directed to our attention by Mr. Alfred L. Robert, medical librarian of Columbia University, and we have redacted copy recently submitted to the Journal in accordance with this plan. This was facilitated by the cooperation of the staff of the Crerar library.

If authors will follow this system from this date it will save extra work for all concerned.

The example quoted by Mr. Robert was taken from February (1934) ILLINOIS MEDICAL JOURNAL as follows:

"Ford, H. L., Deep neck infection—surgical approach, Illinois M. J. 65: 117-128, 1934."

It will be noted that this contains the author's name and initials, title of paper, name of journal abbreviated, volume number in *Arabic numerals,* pages, *first and last,* and year.

The data include everything necessary to locate the article in a library with nothing superfluous.

Similarly *quotations from books* should contain the author's name, title of book, place of publication, publisher's name, year and pages.

Arabic numerals are specified instead of Roman as they are more familiar and less liable to error in copying.

Phony Locutions: "He operated six cases; others were unoperated." It seems incredible that any physician or surgeon could be guilty of such a sentence, but unfortunately it is not so uncommon. Others "operate" patients. Why not operate "in" the case or "on" the patient.

The following quotation from Stedman's Medical Dictionary may clarify this usage:

"*Case* (kās) (L. casus, an occurrence). An instance of disease with its attending circumstances. The patient is not the case; the *patient* dies or recovers, the *case* terminates fatally or ends in recovery; the surgeon operates *in* a case, but operates *on* the patient."

Smith, Brown, etc. Why not Smith, Brown, et al.?

"Cases in whom" should be cases in which, but "patient in whom" is correct.

We again quote the excellent summary of language to avoid from the Journal of the Medical Association of Georgia.

REPREHENSIBLE MEDICAL ENGLISH

TWELVE VALUABLE POINTS IN THE LANGUAGE OF MEDICINE

1. "Case" must not be used for "patient," nor "cure" for "treatment."
2. "Tubercular" means "nodular"; "tuberculous" means "infected with the bacillus of tuberculosis."
3. "Cystoscope" is a noun and must not be used as any other part of speech.
4. It is possible to "operate a cotton-gin," *but it is not possible to "operate a patient"—nor his appendix.*
5. "Acute appendicitis" is common, but an appendix cannot be "acute."
6. "Acute abdomen" is beyond the pale.
7. "Pathology" means the "science of disease"; it is therefore absurd to speak of "pathology in the right lung."
8. "Positive serology" is the worst type of jargon: apparently "positive Wassermann reaction" is usually meant.
9. "Specific" and "luetic" are convenient to obscure meaning from patients' relatives, but "syphilitic" is better in writing for the medical profession.
10. It is incorrect to say the patient had "no temperature." One may say that there was "no elevation of temperature," but it is shorter to say there was "no fever."
11. "Shot" is perhaps the most abused and overworked word in medical literature. Shot is of lead.
12. Bad spelling is unpardonable, so a good dictionary is indispensable.

—Jour. Med. Assn. of Ga.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Illinois State Medical Society
E. S. Hamilton, M. D., Chairman
Kankakee, Illinois

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Address all letters and communications to the Chairman.

The unselfish enthusiasm of conscientious workers in any field is most encouraging and stimulating to all. Having just returned from the annual meeting of the Northwest Regional Conference in Chicago, we are encouraged to continue our attempts to make the rank and file of the medical profession of Illinois realize the dangers that confront the future of the practice of medicine, not only from a strictly economic viewpoint, but also from a scientific one. The attendance at the Conference was influenced adversely by the extreme weather we have had throughout the West for the past month. However, attendance from the states of the northwest was better proportionately than it was from those states immediately contiguous to Chicago. The attendance from Illinois and Chicago was noticeably poor. So much so in fact that some of the men who were influential in forming and running the Conference in former years commented on the same. One of them offered the opinion that evidently the men of the northwest had been better sold on the importance of giving time and thought to the economic problems than those around Chicago. Naturally, this was a little discouraging to those of us, who were instrumental in getting the conference to Chicago this year. The program as outlined in this column last month, went through exactly as scheduled. It was most ably presented and the discussions were thorough and illuminating. It is hoped that the papers and the discussion will be published in the ILLINOIS MEDICAL JOURNAL in the next few months, so that they will be available to all members of the society. At the election of officers, Dr. Braasch of Rochester, Minnesota, one of the founders of the Conference, was elected President, and Dr. Fred Moore of Des Moines, Iowa, was elected Secretary. It was decided to hold the next annual meeting in Chicago next February and the Iowa State Medical Society offered to act as host. It seems as though the future of this conference is assured and the policy of the members to hold their annual meetings in Chicago rather than in the northwest, certainly is or should be a great opportunity for the members of the Illinois State Medical Society to follow and take an active part in the developments of medicine.

Quietly but surely some of the provisions of the Social Security Bill are being prepared for use in Illinois. This is in line with many other states and the consensus of opinion of the men from these states was that it is foolish to oppose the same, but rather the wise thing to do was to help in shaping the work and to cooperate with the state supervisor and try to keep the work in those lines which will do the least damage to the practice of medicine and the most good to the health of the public. Any other attitude seems foreordained to disaster. Dr. Jirka, State Director of Public Health, has shown in this case as in all others a definite desire to be guided by the opinion of his fellow practitioners and we as medical men should appreciate that attitude and help him in every way possible instead of hindering him by either criticism or lack of support.

According to word from Springfield, the Illinois Emergency Relief Commission will cease to function on May 1, 1936. At that time the problem of the care of both the chronic indigent and the unemployed will still be with us and it is incumbent on the medical profession to be ready to meet that day with its attendant problem. During the last year the care of the indigent has been transferred from a Township responsibility to a County one. In the greater portion of the state this has not worked satisfactorily to either the poor, the medical profession, or the politicians. With a greatly increased load thrown on the County Relief organization, under the direct control of the County Supervisors, who maintain that they are short on funds at this time, the problem of the medical care of the indigent will become very acute. The medical profession of every county should meet and talk

this matter over with the idea of forming some kind of a plan for the care of the "County Poor" which will be satisfactory to all concerned. To put off consideration and action on this important problem will be to aggravate the acuteness of the trouble on May 1. There is some talk of return of responsibility to township units, as it has been in the past and as the local supervisors desire, but at this time, no action in that regard has been taken.

Increased interest by lay organizations in medical problems is evidenced by the demand for speakers to address them. This is one of the obligations of the medical profession and any man invited to give a talk to any such organization in his part of the state should accept the responsibility. The Council has made available a list of such speakers from every part of the state and whenever a man whose name is on that list is requested to make a talk, he should accept the opportunity to do something definite for Organized Medicine. We find that most lay organizations are quite sympathetic to the problems of medicine and when the same are presented to them in a proper manner, are in accord with our contention that no change is needed in the United States in the manner of conducting the practice of medicine. However, they believe that some improvement can be made and certainly all of us agree with them and are eager to make any and all such improvements suggested, provided they are for the good of the public.

This month our column contains an article by Dr. C. G. Farnum of Peoria. In addition to carrying a definite message, we feel sure that you will find it most interesting and unusual.

E. S. Hamilton,
Chairman of Committee on
Medical Economics.

The Parables of Sophistes, The Seer

The Just and Upright People That Ignored Self-Preservation

Forasmuch as the Younger Practitioner was aweary from the burden of his labours and inasmuch as his mind was in turmoil from many perplexities, he betook unto himself a day apart and did journey unto the habitation of Sophistes, the Seer, that he might find answer to the questions that harrassed his soul and that he might drink deep from the fountain of learning of the Man of Wisdom.

Saith he, "Oh, Sophistes, the Seer, for lo, these many comings and goings of the seasons have I practiced the healing art in behalf of the people of my city. I have observed the doings of my colleagues with a mighty interest nor have I reproved them or rebuked them when they did evil in my sight. I have attempted to commune with them upon the problems that well up into my mind and found little but ignorance, indifference or confusion.

"Each planting time I have taken myself into the concourses of my fellows and have harkened with care unto the spoken wisdom of mine elders, for there abideth in me a great faith in the holiness of our profession. There have I heard much of the art and the science of our calling and of the newer things in healing and chirurgie, but only with rareness have I heard someone who hath seen the evil that is under the sun, extoll on the dangers that compass us about. And such have been for the larger part only appeals for defense against those who wish us not well, and those things that my mind seeketh receive no reply.

"Thereby come I to thee, Oh Sophistes, the Seer, for thine heart hath had great experience of wisdom and knowledge. I would learn of thee thine answer to the vexatious questions that harrass my spirit, for long have I communed with mine own heart and reply cometh not and my soul is torn with doubtings.

"Much have I read and to many exhortations have I harkened pertaining to encroachment upon the field of our labours and in each instance it cometh as a call to arms in defense of some added theft of our rights or our possessions. Ever hath it been thus, that which hath been is now, and that which is to be hath already been.

"In the military from the days of the warlike Hittites it hath been proscribed that the ablest defense is a vigorous offense. Yea, even the gladiator in the arena followeth this course.

"Wherefore then, Oh Sophistes, remain we unprepared for these battles until we are attacked and then forsooth, must rush forth unprepared? And moreover, when each battle is finished, why fold we our hands and why rest we until another forthcometh?

"It befalleth that no army winneth all its battles. Thereby, since we fight only in defense,

it cometh to pass that the enemy gradually taketh from us this and that of our possessions and our field narroweth to the vanishing point.

"Why, Oh Learned One, hath not an offensive campaign been evolved out of the wisdom of our leaders, that not only protecteth us at time of thefts, and onslaught, but mayhap might even recover some of our possessions that have been taken away?"

Then spake Sophistes, the Seer:

"Beyond the mountains from the country of my birth lay another country of many fertile plains and valleys and the people of that country were a people of great wisdom and intelligence. Skilled were they in the arts and the sciences and diligent were they in all things that were good for the sons of men.

"So great and manifold was their wisdom that they did walk in the way of uprightness and integrity and so greatly did they excell in zeal and diligence that they did prosper with exceeding greatness. Their habitations were like unto no others, their fields and their vineyards were larger and their flocks were without number.

"From generation unto generation their race waxed greater in numbers and in wisdom and in the approbation of the learned and judicious and their name was precious among all peoples.

"Howsoever so given were they to their occupations and to the furtherance of their wisdom and the well being of their neighbors that they gave scant heed to the protection of their fields or their flocks or their households.

"Now it came to pass that many ill meaning persons of the surrounding countries and those who were not of that race, with covetousness and avarice in their souls and malice in their hearts, did attempt to steal way their possessions. Oft-times in the diligence of their labours this was unheeded and it was only when great fields were taken away that much indignation arose among them and though they were unskilled in arms, in the fury of their wrath, they did valiant battle against the enemy. It came to pass that sometimes they drove the enemy forth and did preserve their properties but all too oft the hand of the enemy prevailed against them.

"Howsoever the battle was no sooner finished than they went their way to their labours and gave no further heed to wars and warfare.

"Forasmuch as this repeated itself times without number throughout the generations it came to pass that their possessions became less and less to the point of nothingness through the transgressions of their enemies.

"Of a truth there were a few who cried out against such folly but they were as a voice crying in the wilderness to which none paid heed.

"From time to time the lustful tetrarch of the province, being not of their race, did impose upon them taxes of great burdensomeness and though they did protest each time with great vehemence and though their anger was hot against such injustice, the collection of the taxes went on and even greater ones were imposed. Many of their fields were taken away or reduced, many of their possessions were taken away from them, their flocks were taken over by those of inferior race and they were reduced to penury and want, yea, it remindeth one of Nineveh and Babylon!

"Yesteryear at harvest time there cometh a learned traveler from that country who recounteth to me that the Imperial Dictator hath now decreed that the entire country and its people and all their possessions shall be placed under his domain and that this just and upright people shall henceforth put forth all their labour for the Imperial Dictator and his horde of cohorts which are as grasshoppers for multitude. He further saith that again there is a great indignation and a mighty call to arms but he feareth that by reason of their unskillfulness in warfare they will fall before the army of the Dictator and that henceforth they will be little better than slaves and will be bound by the chains of darkness and that the last days of this righteous people shall be worse than the first.

"Verily, my Young Friend, thou hast spoken wisely—I fear me that unless our profession ceaseth to lie supinely and riseth only when trampled under foot, unless it developeth a definite campaign of aggression, then it walketh into the darkness of oblivion even as that worthy race of which I have told thee.

"Of a truth a campaign of aggression fitteth unseemly into a life that devoteth itself to the furtherance of the arts and the sciences, yet it behooveth each one who so occupieth himself so to do, forasmuch as that offereth the only means of self preservation and defensive fighting resulteth only in losses that lead unto disaster."

So saith Sophistes, the Seer.

C. G. Farnum, M. D. Peoria, Illinois.

EDUCATIONAL COMMITTEE REPORT

February—A Month of Progress

SPEAKERS' BUREAU:

Although February was a short month, there were many club meetings held with programs devoted to health subjects.

54—Programs were arranged by the Educational Committee and these were possible because of the cooperation of the following doctors in filling the requests:

F. N. Wells
M. R. Guttman
W. O. Thompson
J. T. O'Neill
W. W. Bauer
C. S. Skaggs
Myrtle Jean McBean
Dr. Bennett of Canton
J. J. Gill
E. H. Ochsner
Elias Selinger
H. W. Elghammer
Harold Shellow
Frank F. Maple
Kenneth H. Schnepp
E. S. Hamilton
Clara Gottschalk
Arlington Ailes
F. R. Towner
Walter Fischer
Frank J. Jirka
D. P. MacMillan
R. L. Green
Leo K. Campbell
Frederick C. Test
R. H. McPherron
F. M. Jansey
Meyer Solomon
J. R. Ballinger
Edmund Jacobson
Ray C. Armstrong
Ben H. Huggins
Ralph H. Kuhns
George W. Post, Jr.
Clarence A. Neymann
William Beecher
C. P. White
Charles N. Pease
Norris J. Heckel
P. A. Teschner
Carolyn MacDonald

A great variety of health topics were suggested by the program chairmen of these lay organizations. Among the subjects presented by representatives of the Educational Committee Speakers' Bureau were these:

Facts and Fancies in Plastic Surgery.
Outstanding Discoveries in Scientific Medicine.
Fat and Thin.
Conquest of Children's Diseases.
Popular Beliefs That Are Not So.
Colds, What Are They?
The Social Security Act.
Mental Hygiene for Adolescents.
Feet and Posture.
The Story of Blood Transfusion.
First Aid and Accident Prevention.
Recreation and Health.
Insomnia and Mental Health.
The Story of Bacteria.
Socialized Medicine.
Your Eyes.
Communicable Diseases Among Children.
Children and the Movies.
Your Skin and How to Care for It.
Appendicitis.
Allergy.
The Kidney and Related Diseases.
Relation of the Home to Health.
Eat, Sleep and Wash given before an assembly of 1,300 high school boys.

SCIENTIFIC SERVICE APPOINTMENTS:

23—Scientific programs were presented before County Medical Societies.

The names of the county societies and the doctors who presented programs are listed:

Bureau County—D. H. Levinthal.
Scott County, Iowa—R. H. Jaffe.
Vermilion—Frederick H. Fall—Gynecological and Obstetrical Clinic.
Vermilion—Channing W. Barrett.
Will-Grundy—N. C. Gilbert.
Livingston—John F. Carey.
Sangamon—Joseph Brenneman.
McLean—C. I. Reed.
Winnebago—M. Herbert Barker.
Will-Grundy—Fred M. Drennan.
Henry—Ford Hick.
Henry—C. M. McKenna.
St. Joseph's Hospital, Elgin—William J. Pickett.
Champaign—James H. Hutton.
DeWitt—Joseph E. F. Laibe.
Decatur—Isaac A. Abt.
Will-Grundy—Leon Unger.
Whiteside—Harry E. Mock.
Sherman Hospital, Elgin—C. R. G. Forrester.
LaSalle—Edward Tatge.
LaSalle—Edward Roling.
LaSalle—Tell Nelson.
Will-Grundy—Frank B. Kelly.

MATERIAL ON SOCIALIZED MEDICINE:

In addition to the list of cities given in the January report, the Educational Committee has sent material on socialized medicine to doctors and debating teams in the following cities:

Armington
Altamont
Beecher City
Brownstown
Belmont
Blue Island
Chicago
Centralia
Charleston
Carbondale
Clay City
Clinton
Carlyle
Danville
DeWitt, Nebraska
Decatur
DuQuoin
Effingham
Elgin
Evanston
East Moline
East St. Louis
Geneseo
Hinsdale
Havana
Independence, Kan.
LaGrange
Lincoln
Litchfield
Murphysboro
Mendota
Maywood
Macomb
Moline
Montrose
Marion
Niles, Michigan
Ottawa
Oak Park
Peoria
Pekin
Pratt, Kansas
Princeton
Quincy
Rock Island
Rockford
Springfield
Salem, Ohio
Silvis
Spring Valley
St. Francisville
Trenton
Tallula
Urbana
Waverly
Walbyt

RADIO:

21—Programs were given over Chicago Radio stations. The talks presented by members of the Chicago Medical Society were approved by the Educational Committee. At the present time the Committee sponsors health programs over the following stations at the hours indicated.

Tuesdays—
9:35 A. M.—WBBM.
10:30 A. M.—WJJD.
1:45 P. M.—WAAF.
2:30 P. M.—WGN.

Thursdays—
10:30 A. M.—WJJD.

Fridays—
1:45 P. M.—WAAF.

Members of the Society are urged to listen in and also to tell their patients of these broadcasts. The

Committee does not announce that copies of the talks are available, yet many requests do come in. Letters or cards of approval of these broadcasts sent to the stations are of course a help in showing the amount of interest in these health broadcasts.

During the month of February talks were given by

Harry A. Oberhelman—Goiter.

Edward H. Ochsner—What About Socialized Medicine?

Arthur S. Sandler—Adolescence.

John B. O'Donoghue—Stomach Ache.

G. Henry Mundt—Sinus Disease.

Percy E. Hopkins—Cancer.

Earl O. Latimer—Goiter.

W. C. Bornemeier—Humidity and Health.

Clarence S. Duner—Pain in the Chest.

Clarence L. Wheaton—Common Colds.

E. H. Blair—Periodic Health Examinations.

Frank F. Maple—The Woman of Forty.

S. C. Kehl—Feeding the Child for Health.

Myrtle Jean McBean—Recreation and Health.

W. D. Sutliff—Pneumonia.

Raymond F. Elmer—Appendicitis in Children.

Jay Ireland—Broken Bones.

Charles E. Pitte—Dangers of Colds.

R. M. Hutchison—Cocksureness in Diagnosis.

Norman Leshin—The Most Common Human Illness.

S. Perry Rogers—Men Hurt at Work.

MISCELLANEOUS:

528—Health articles were sent to Illinois libraries.

6—Articles on child care sent to Blackhawk Park Nursery School.

75—Letters mimeographed for Public Relations Chairman of Woman's Auxiliary.

PRESS SERVICE:

Health articles approved:

Three Most Common Forms of Heart Disease.

Chicken Pox.

Tonsils and Adenoids.

Scarlet Fever.

Cod Liver Oil.

Our Children and their Allergies (2 articles).

20—Health articles sent to newspapers for monthly publication.

403—Health columns sent to newspapers outside of Chicago.

77—Health columns sent to Chicago and suburban papers.

The *News Gazette* of Champaign is now on the mailing list to receive health articles for publication over the signature of the Champaign County Medical Society.

NEWSPAPER PUBLICITY FOR MEDICAL SOCIETIES:

48—Releases for Henry County.

41—Releases DeWitt County.

45—Releases Whiteside County.

57—Releases LaSalle County.

33—Releases Perry County.

Newspaper service to Chicago Medical Society branches:

5—Releases to newspapers for Calumet Branch.

4—Releases to newspapers for Northwest Branch.

4—Releases to newspapers for North Shore Branch.

5—Releases to newspapers for Englewood Branch.

2—Releases to newspapers for Northside Branch.

SPECIAL SERVICE TO COUNTY MEDICAL SOCIETIES:

328—Notices Bureau County Medical Society.

426—Notices Henry County Medical Society.

296—Notices LaSalle County Medical Society.

153—Notices Whiteside County Medical Society.

139—Notices Perry County Medical Society.

Respectfully submitted,

JEAN MCARTHUR, *Secretary.*

THE WOMAN'S AUXILIARY of THE CHICAGO MEDICAL SOCIETY

Activities

MEETINGS

Sherman Hotel.

Luncheon with the Presidents of the Branch Medical Societies as guest.

Speaker—Mrs. Robert Fitzgerald of Milwaukee, Wisconsin, President-Elect of the Woman's Auxiliary of the American Medical Association.

Subject—Activities of State Auxiliary.

La Argentina—Civic Opera House to raise funds for the Lay Education program and distribution of Hygeia to Reading Rooms, Libraries, Schools and Y. M. C. A. and Y. W. C. A.

Laity Day Luncheon and program at the Blackstone Hotel.

Speaker—John R. Neal, M. D., Chairman of the Illinois State Legislative Committee, Springfield, Illinois.

Guests—Officers of the Illinois League of Women Voters, Parent Teachers Associations of Illinois, Public Health Chairmen of the Districts of the Illinois Federated Women's Clubs, President of Federated Clubs and other Organizations.

Plans are now being made for booths with exhibits on Health Education and Hygeia for the Women's Pageant of Progress at the Navy Pier, April 18th to 26th, 1936.

MEMBERSHIP DRIVE

Started December, 1935.

South Chicago Branch of the Chicago Medical Society, organized December, 1935.

Many new members have been added to the Woman's Auxiliary.

EVERYTHING IS UNDER THE WEATHER

The dog has a case of phlebitis, the roof has shingles, the bees have hives, the parrot has peritonitis. The windows have panes, the cistern has never been well, the new laundered clothes are mangled now, and the maid has turned into a belle. The setting hen's chickens are breaking out, and the chimney 'tis said has the flue, the grass has been cut, the flivver is tired, and the milk in the pitcher is blue. The lamps are "lit" up, and the pictures are hung, the rugs have been beaten, the clocks all have ticks. Oh! things surely seem, as the black parson said, like the world's "in a heluvafix."

THE NATIONAL CONGRESS OF PARENTS AND TEACHERS SPONSORS SUMMER ROUND-UP OF THE CHILDREN

The National Congress of Parents and Teachers and its state and local units realize the importance of working with organized medicine in conducting health programs. The Advisory Committee on the Summer Round-Up of the Children is making progress in educating the state and local units as shown by its 1936 Plan of Procedure pamphlet, excerpts of which follow.

"The Summer Round-Up of the Children is a campaign to send to the entering grade of school or kindergarten a class of children as free as possible from remediable defects. The ultimate goal is to educate parents to the need for early periodic examination of their children. Since this is an educational movement, parents should be encouraged whenever possible to take their children to the family physician and dentist for the examination. Where it is not possible for parents to do this, group examinations are advised."

"A meeting of the Executive Committee of the local unit should be called by the President for the purpose of discussing the campaign. The school superintendent, or principal (or both), the health officer, school physician, the school nurse, the kindergarten or first grade teacher, the secretaries or representatives of the county medical and dental associations and representatives of all civic organizations should be invited to attend the meeting, for the Round-Up is a cooperative project of the parent-teacher association."

"The organization and arrangement for physicians and dentists to examine the children should be made by a joint council of representatives from the local parent-teacher association, the local Medical Society, the local Dental Society, the Health Department, or the School Health Service of the Public Schools, a representative of the Public Health Nursing service, the School Superintendent, or his representative, and such other agencies as may be deemed advisable.

"This group should determine how the examination shall be made, after consultation with the examiners.

"The DATE for the Spring Examination should be decided upon in consultation with this joint council."

"All preparations for the examination should be made in consultation and cooperation with the joint council. It is important that time be allowed for the examining physician and dentist to discuss the condition of each child with the parent.

"Wherever possible examinations at the office of the family physician and dentist should be encouraged. Where examinations are made at the office of the family physician and dentist the official examination blank should be used and should be returned to the local Summer Round-Up Chairman following the examination with the findings and recommendations of the physician and dentist."

"The Follow-Up Committee, in cooperation with the Public Health Nurses, should visit the homes during the summer months, following the examination, and urge parents of children with defects to seek the family physician and dentist for advice and treatment. When cases of financial inability are discovered, arrangements should be made for assistance from local organized relief agencies.

"Parent-Teacher members are in a position, as are those of no other organization, to visit the homes, stress the value of sound health, both for the child and the community, round up the children for examination and urge the parents to take them to the family physician and dentist for further advice and treatment."

"It should be clearly understood that the Congress does not advocate free medical or dental service for the correction of defects, but refers the child to the family physician and dentist for treatment, unless it is found necessary to seek some benevolent agency to provide the needed service in selected cases.

"Until parents become fully educated to the responsibility for the health of their children and realize that periodic health examinations are desirable from birth on, the Summer Round-Up will be necessary. Parents will then seek for their children periodic examinations by the family physician and dentist and will pay an adequate fee for this service. We have not yet arrived at the time when all parents understand and recognize this need, and the examination in the spring brings to the attention of the parents the physical defects which need correction."

GOVERNMENT ABSTRACT OF VENEREAL DISEASE INFORMATION

Venereal Disease Information is a monthly publication prepared by the U. S. Public Health Service for distribution among the medical profession throughout the United States. It measures approximately 6 by 9 inches and ranges in size from 25 to 75 pages.

It is the purpose of the Public Health Service in issuing this publication to provide in condensed form a monthly summary of the scientific developments in the diagnosis, treatment, and control of syphilis and gonorrhea. More than three hundred American and foreign journals are reviewed for this work. Abstracts are made of articles describing laboratory, pathologic, and clinical work in the field of venereal diseases.

The most important literature on every phase of the subject is presented in the form of brief abstracts that are easily read. An index for the year is published with the December issue.

During the past year thousands of physicians found this publication useful in enabling them to keep abreast with developments in venereal disease work.

The cost of this publication is only fifty cents per annum, payable in advance to the Superintendent of Documents, Government Printing Office, Washington, D. C. It is desired to remind the reader that this nominal charge represents only a very small portion of the total expense of preparation, the journal being a contribution of the Public Health Service in its program with State and local health departments directed against the venereal diseases. If you wish to secure the valuable service which this monthly magazine provides, send fifty cents to the Superintendent of Documents, Government Printing Office, Washington, D. C.

PROFESSIONAL SERVICES NOT TO BE ADMINISTERED THROUGH A THIRD PERSON

According to an action taken by the House of Delegates of the American Medical Association it is unethical for a third person to act as an intermediary in furnishing medical service. The following is the House of Delegates resolution:

"It is unprofessional for a physician to dispose of his professional attainments or services to any lay body, organization, group or individual, by whatever name called, or however organized, under terms or conditions which permit a direct profit from the fees, salary or compensation received to accrue to the lay body or individual employing him. Such a procedure is beneath the dignity of professional practice, is unfair competition with the profession at large, is harmful alike to the profession of medicine and the welfare of the people, and is against sound public policy."

DR. RAYMOND LEAVES ROCKEFELLER INSTITUTE TO HEAD SEARLE RESEARCH

Announcement has just been made by G. D. Searle & Co., Chicago, of the appointment of Dr. Albert L. Raymond as Director of their Research Laboratories.

To take this Searle appointment, Dr. Raymond resigns from the Rockefeller Institute of Medical Research, with which he has been connected for the past nine years, the last seven of which he was an associate of Dr. Levene.

For two years he was National Research fellow, working on problems connected with the biological mechanism of carbohydrate degradation.

Dr. Raymond is a Californian and gained his Ph.D. at the California Institute of Technology, Pasadena, in 1925. Afterwards he spent three years part-time teaching at California Institute of Technology and at the University of California.

He is a member of the American Chemical Society and the American Society of Biological Chemists.

ANNUAL MEETING OF THE AMERICAN COLLEGE OF SURGEONS

The American College of Surgeons will hold its Sectional Meeting for the States of Illinois, Virginia, Tennessee, Missouri, Indiana, Ohio, West Virginia, and Kentucky, in Louisville, Kentucky, on March 19-20-21, next.

Clinics will be held at the local hospitals. Special programs by leading surgeons and hospital authorities will be held at the Brown Hotel, which will be headquarters. The banquet will be on Thursday evening and a public session will be held at the Municipal Auditorium on Friday evening.

The profession of Louisville and of Kentucky extends a cordial invitation to the physicians of Illinois to be present and to help make this session a success.

A. T. McCormack, M. D., *Secretary*,
532 Main St., Louisville, Ky.

PREVENTION OF BIRTH INJURY AND ITS RESULTING MORTALITY FROM THE STANDPOINT OF THE OBSTETRICIAN

Charles Edwin Galloway, Evanston, Ill. (*Journal A. M. A.*, Feb. 15, 1936), points out that birth injury may occur in any type of delivery. Therefore, it is essential that a careful explanation be given to parents, and the most valuable explanation comes from the consultant, most often the pediatrician, who is not present at the birth. The incidence of birth injury is very difficult to ascertain. At the Evanston Hospital, investigation of the last 5,000 deliveries reveals that there were fifty-one major injuries including fatal cerebral hemorrhage. Besides these there were thirty-seven minor injuries including abrasions from forceps and other contusions of minor importance. At the same hospital an analysis of the fetal autopsies for the last ten years shows that 34 per cent of these fetal deaths including premature babies were due to cerebral hemorrhage. It also shows that 40.6 per cent of the autopsies on full-term babies dying at birth demonstrated cerebral hemorrhage. Of the various injuries cerebral hemorrhage, no doubt, occupies the primary position as to both severity and mortality. The author discusses the therapy and possible prevention of cerebral hemorrhage, brachial palsy, fractured clavicle, facial paralysis, sternomastoid muscle injury, rupture of the liver and breech delivery.

Original Articles

THE BACILLUS OF CALMETTE AND GUERIN (B.C.G.) IN THE IMMUNIZATION AGAINST TUBERCULOSIS

SOL ROY ROSENTHAL, M.D.
CHICAGO

Koch's original statement that only living tubercle bacilli producing a mild infection can accomplish immunization has weathered the vicissitudes of time. The use of old tuberculin, killed tubercle bacilli whether by heat or chemicals, lipoid extracted or lipoid free bacilli, have all proved to be futile in their protective properties against a tuberculous invasion.

Tuberculosis rather simulates syphilis, leprosy, melitensis, in that an immunity lasts as long as the organism remains parasitic in the body. In this way it differs from diphtheria, smallpox or typhoid fever in which the diseases or their vaccines renders the body refractive to reinfection from the same organisms.

Positive experimental evidence that immunity does exist in tuberculosis is expressed in Koch's phenomenon. Stated briefly, a tuberculous infected guinea-pig reacts to a subcutaneous reinfection with superficial necrosis, ulceration and spontaneous healing, whereas a non-infected animal develops after a time a tumor at the site of inoculation with generalization of the process. A safe method of applying living organisms to man and beast had its early beginnings when Theobald Smith showed that there were at least two types of tubercle bacilli, namely bovine and human, and that these strains were less virulent for the heterogenous hosts.

Von Behring applied the above principle with success in vaccinating calves. He used human tubercle bacillus which had been attentuated for six years. However, the danger of such a method is apparent in that the animals excrete tubercle bacilli in their milk over a long period of time. Calmette and Guérin working on the same hypothesis isolated a bovine tubercle bacillus from a heifer in 1908, and proceeded to attenuate this organism by culturing it on potato to which glycerinated (5 per cent) bile had been added. After 230 such transfers over a period of thirteen years, this organism was found to be avirulent to guinea-pigs and rabbits even when given in large doses. Tubercles formed after inoculation which did not go on to caseation but rather to resorption.

Immunization with the above living attenuated bovine bacillus was begun on an experimental basis in calves (Guérin, Richat, Boissiere, Ascoli, Gerlach, the Ukranian Commission, Assis and Dupont (Brazil), the Commission of the National Research Council of Ottawa (Canada) and in anthropoid apes (Wilbert, Kraus, Gerlach). This work has shown that when B.C.G. (Bacillus of Calmette and Guérin) was introduced in suitable doses into animals free from preexisting tuberculosis and that when these animals were kept isolated for one to two months from all infectious contact, it conferred upon them along with tuberculous allergy, a manifest resistance to virulent infections incurred either by cohabitation, ingestion or inoculations which are of a mortal degree for control animals. This resistance lasts approximately eighteen months in cattle, but it can be maintained and reinforced by reinoculations.

Having established the avirulence of the organism and having shown that a certain amount of immunity was obtained in animals, the application of this vaccine in humans was justified, and thus in 1921 Weill-Hallé and Turpin in the Maternity Division of the Charité in Paris fed an infant born of a tuberculous mother 2 mg. of B.C.G. on the third, fifth and seventh days after

TABLE 1. COUNTRIES USING B. C. G. AND THE RESULTS OBTAINED THEREOF

County—City	No. Children Inoculated	Mortality Tuberculosis in per cent.	No. Not Inoculated	Mortality Tuberculosis in per cent.
Germany—Bleaif	203	0.5	98	3.0*
Belgium—Siegl	2165	6.0	2165	29.8*
Bulgaria—Sofia	766	8.6	766	15.7*
Spain—Barcelona	1065	2.1	1065	11.0
Greece—Athens	3421	0.8	....	12.0
Holland—Utrecht	55	0	53	71.5*
Hungary—Ujhest	500	0.6	....	...
Poland—Warsaw	8674	12.2	....	38.0*
Rumania—Bucharest .	60000	1.3	....	25.0*
Russia—Kharlsoff ...	1500	2 to 3	....	15 to 16
Sweden—Gothemburg. (Dr. Wassen)	4009	2.3	8342	9.5
Sweden—Gothemburg. (Dr. Wallgren)	230	0	....	0.4
France	280000	3.4	....	15.9
Brazil—Rio	2300	0	....	15.1
Canada—Montreal	1700	3.6	....	25.0*
New York	208	0.9	350	8.0*
(Dr. Park)	413	0.5	608	2.8

*Contact with tuberculous individuals.

Presented before the Section on Public Health and Hygiene, Eighty-sixth Annual Meeting, Illinois State Medical Society, Rockford, May, 1935.

birth. The child who lived with its grandmother (also tuberculous) developed normally. Thus assured, 10 mg. of the vaccine was given to 317 children from 1921 to 1924 on the third, fifth and seventh days after birth (30 mg. all told)[1]. Only one child, who lived with his tuberculous mother, developed tuberculosis. From that time on B.C.G. has been used in tuberculous vaccination in France and her colonies, Roumania, Hungary, Sweden, Norway, South America, Africa, the United States, Holland, etc., so that at the present time several million infants have been thus protected. (See Table 1.)

The above chart is representative of the innumerable reports from every quarter of the globe where B.C.G. vaccination is employed. In every case a decrease in mortality from childhood tuberculosis is reported. Many of the reports were not sufficiently controlled so that their results may be questioned but the accurately controlled data of Wallgren, Park and Kereszturi are beyond dispute and they too show a reduction in death rates from tuberculosis where vaccination was employed.

However, the tuberculosis mortality in childhood is very low and one would question the advisability of vaccination. Yet, one loses cognizance of the fact that the majority of children, especially in congested areas, develop primary tuberculous foci as noted clinically by the tuberculin test and at the post mortem table. (Parrot, Küss, Ghon and author's personal experience). The following chart illustrates this point.

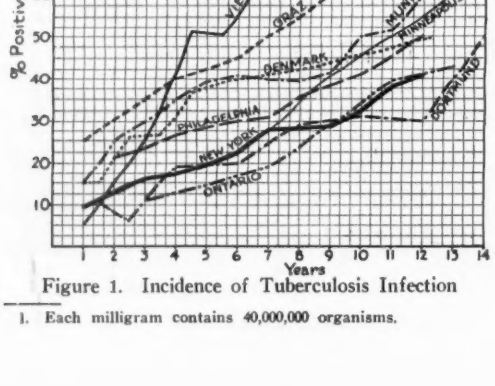

Figure 1. Incidence of Tuberculosis Infection

1. Each milligram contains 40,000,000 organisms.

The number of positive tuberculin reactions increases rapidly after the first year so that at the time of the fourteenth year the percentage is high, 40 to 95 per cent. Where the Mantaux test is employe and where increasing doses of tuberculin are given (up to 0.1 c.c. of a 1:100 solution of old tuberculin), the reactions approach nearer to the higher figures. This primary infection although acting benignly in the infant and child, is instigated by a virulent tubercle bacillus, as can be demonstrated by animal inoculation.

The presence of this virulent organism in the body is a constant source of danger to the individual, a fact generally admitted. Unquestionably, early generalization of the tuberculous process is endogenous in character and more evidence is being gathered to show that the so-called reinfection, i.e. the tuberculous process confined to one organ (most commonly the lung) is also to some extent of endogenous nature. From an anatomic standpoint this is unequivocal in a moderate percentage of cases (author's own experience).

Confronted with the facts then that a primary tuberculous complex occurs in the majority of peoples in civilized countries, that this infection is initiated by a virulent organism whose numbers are uncontrollable, it would seem logical to administer a vaccine of avirulent tubercule bacilli that are constantly assayed under the most exacting surveillance and whose numbers can be adjusted. It is admitted that absolute freedom from exposure to the tubercle bacilli would be ideal and superior to vaccination but in our present civilization this is not possible.

Criticism. The three important sources of attack against B.C.G. vaccination have arisen from 1, the Lubeck disaster, 2. the dissociation of the organism by Petroff and 3. the allergic state produced by vaccination.

1. The disaster in Lubeck, Germany, where many infants died from a virulent tuberculosis following oral vaccination has been shown unequivocably by the German Government (Bruno Lange of the Robert Koch Institute of Berlin) to be the result of gross carelessness on the part of the bacteriologist, who contrary to the dictums laid down by Calmette and Guérin cultivated virulent tubercle bacilli side by side with the B.C.G.!! An exchange of cultures resulted in

the vaccination of infants with virulent tubercle bacilli![1]

2. Petroff claimed to have disassociated the B.C.G. into an 'S' form which was virulent for laboratory animals, and an 'R,' form which was avirulent for same. Other workers, using varying methods, have verified this work. However, for the past six years these reports have become fewer, indeed Petroff himself by personal communication to the writer stated that the present organism is probably 'R' in character and stable. Reed was unable to dissociate the Paris strain after a period of five years.

For the past year and a half the writer, using practically all methods described in the literature, has not been able to completely dissociate the B.C.G. (employing a culture that he received from Dr. Guérin with whom he had been working at the Pasteur Institute in Paris). It is true that a splitting up of the colonies into 'R' and 'S' forms does occur but the latter are only transient and are avirulent. In over 200 animals (guinea-pigs and rabbits) inoculated by varying routes there were no cases of progressive tuberculosis.

3. It is not within the scope of this paper to discuss allergy and immunity in tuberculosis. There are already numerous volumes on the subject. That these phenomena are not entirely estranged is clearly seen in the Koch's allergic phenomena (see above), the only evidence we have thus far that immunity in tuberculosis exists.

The detrimental effects of allergy in tuberculosis have only been shown conclusively in experimental studies, where two factors are paramount, 1. an hyperergic animal and 2. a massive reinfection. Although the former may be present in man, the latter is exceedingly rare. From exogenous sources the number of bacilli inhaled or otherwise entering the body is exceedingly small as compared to the amount employed experimentally (say 1 mg. intravenously!) Allergic animals tolerate small doses of virulent organisms with impunity.

Endogenously, massive reinfection in man may occur as from the breaking into the blood stream of a caseous lymph node. This occurrence is exceptional. If the primary infection were affected with an avirulent organism, caseation and erosion of blood vessels would not occur. Early generalization if it transpires would be a benign affair (author's experience).

Summary. The bacillus of Calmette and Guérin by intensive laboratory studies has been shown to be avirulent and affects a sort of immunity against tuberculosis.

It is argued that as the majority of people eventually develop a primary tuberculous complex initiated by virulent organisms and thus a constant source of danger to the host, it would seem plausible to employ avirulent tubercle bacilli (*B. C. G.*) to effect this primary infection, as the latter may be constantly controlled and assayed.

1853 W. Polk Street.

DISCUSSION

Dr. Lloyd Arnold, Chicago: One could give an almost endless discussion on this paper. I only wish to touch upon two points briefly. One is the viewpoint of the bacteriologist and one the viewpoint of the individual interested in public health. From the bacteriological viewpoint, which is the viewpoint of a good many people who have worked with B.C.G., one of the most important questions we are investigating now is disassociation, that is, changing the environment of the bacterium and watching the changes in that bacterium as it adapts itself to the new environment. We are producing artificially certain stimuli, whether light waves or acid or alkali, food or living tissue or what not. Basically we are producing environmental changes, and then we study the bacteriological mechanism of adaptation. That is what disassociation is, in a nut shell. Bacteriologists are interested in studying that problem now. We know we can disassociate bacteria into virulent and avirulent and midway between groups. B.C.G. has been studied from that standpoint and, like the vast majority of all bacteria that have been studied, it is possible with drastic enough methods to produce disassociation. But you can do the same thing with the human tuberculosis strain; you can do the same with the typhoid bacillus and the same with the gonococcus or the meningococcus and streptococcus and all of them. It simply means that it is a common biological phenomenon.

The most important point is, if the Calmette method of culture is followed out and followed out rigidly, then disassociation doesn't take place. That's the important point, and that I think we all agree upon now.

It is possible to disassociate it by using drastic methods, but using the recognized method of Calmette, that he has followed out so carefully and painstakingly for almost thirty years now, that organism isn't disassociated; it remains stable, true to form. That it is possible to disassociate it from a bacteriological stand-

1. The laboratory of the writer is completely isolated. No other bacteria are cultivated but B.C.G. and all persons (including the porters) who enter the culture rooms are examined carefully for active tuberculosis (including x-ray and sputum examinations).

point, I will say it is. But from the safe standpoint, if we carry it through the proper culture medium, it doesn't disassociate, doesn't split off in virulent or in changed forms from the stock culture. From the public health standpoint, I think that is the most important thing.

I think most students that have observed public health work recognize declines in our tuberculosis mortality. We have little data on the morbidity curve; but our curve of mortality in tuberculosis has been gradually decreasing per 100,000 population. The decrease was rather rapid, the trend line has become a little less steep. Now, it has a slope to it, but the slope is the angle of the trend line, and the slope is smaller. The smaller the angle, from a public health standpoint, that usually means in all diseases, and I think it means in tuberculosis, too, that the methods we have used to reduce the incidence have yielded us the maximum results. And as the curve gets flatter and flatter it means we are getting all we can get out of the methods we are using. Then it is time to try something new in order to reduce it and, in order to get the angle to fall more, I think B.C.G. offers us something from that standpoint. I think it is safe. I think if we carry out the Calmette method of culture and the methods of control of animal inocculation, as we have been doing, I think it would be a safe method and I think from a public health standpoint we can go into the morbidity and mortality of tuberculosis quite at length. But, briefly, I think the methods we have been using, in the past we have gotten about all we can get out of them. We can apply them and keep on going a little lower and lower. We don't want to ignore or let up on anything we are doing. I think this is an added lever. And for those exposed, under proper controlled conditions, I think it is worthy of trying it out.

The paper is now open for general discussion and I would like to take the opportunity of calling on Dr. Tice, of Chicago, an internist and not a bacteriologist, if he will say just a few words.

Dr. Frederick Tice, Chicago: From a clinical standpoint we are all, of course, very much interested in the problem of tuberculosis. Personally my interest may be much greater than that of some of the others particularly because of tuberculosis in our family. It has been a subject that appealed to me very much, even as a medical student.

The work done recently, or at least called to our attention recently, by Calmette is most important. From a bacteriological standpoint I can not give you any additional information excepting as contained in a review of the literature. From personal inspection in the Pasteur Institute, Calmette convinced me that there was simply no contraindications for the use of the vaccine. From a clinical standpoint, I can only tell you that we have no further information because there have been no vaccinations in the State of Illinois. Some work has been done, as you know, in America and particularly by Overton of Nashville, Tenn. Up to the present time he has vaccinated several thousand cases without a single unfavorable result.

The problem to us as clinicians is simply, first, is this a harmless procedure? We think from all we can learn that the question is not to be debated, that there is no harm if the technique is followed. And the second problem is, how much benefit is to be derived? That, of course, is a problem that can not be answered at this time. There seems to be a little diversity of opinion as to the question of allergy and immunity. We belong to the group that believes that the two are identical. We don't believe that they are separate entities or antagonistic. We also believe that the tuberculin test is the only means at our command at the present time to determine the existence of immunity; and if a tuberculin reaction is produced by the use of the vaccine, then we can conclude that we are producing a beneficial effect. How long that may exist is a problem that all workers using the vaccine are attempting to determine. Whether it will continue for two years, six years, eight or ten years, nobody knows. We believe that immunization in tuberculosis is one of the biggest problems that confront every physician and every public health officer today and we believe that this is a means unassociated with danger and capable of producing an unlimited amount of benefit; how much we do not know.

Dr. Robinson Bosworth, Rockford: I have been very much interested in this subject for some little time, largely because of the controversy which exists relative to whether or not the first infection type of tuberculosis confers immunity. We acknowledge the views of Myers of Minneapolis in which he cites the first infection type of tuberculosis as being a benign process, and the second or reinfection type being a malignant process. Myers has gone so far as to claim that it is much better to avoid the first infection type and therefore from that argues that vaccination from the Calmette vaccine establishing immunity or allergy as it does, places that individual in a dangerous position when he does receive his next infection, because it then will be followed by the malignant type instead of the first infection or the benign type.

I want to ask Dr. Rosenthal a question. I came in late, but I got one statement from him to the effect that the first infection type produces immunity, and I want to ask him again if he is strictly of the impression that the first infection type produces such a degree of immunity as will in the long run protect the *average* individual against the development of the malignant type or the second infection type of tuberculosis.

Dr. Maurice L. Blatt, Chicago: I believe that Dr. Arnold struck the keynote in this discussion when he said that the plane of incidence of mortality and morbidity in tuberculosis had reached a level of decline so slight that the necessity for some new procedure was indicated. This basis for proceeding to do the thing that is now under discussion is the pos'tion that Dr. Arnold has assumed.

The facts shown statistically by Dr. Rosenthal are not such that we who do pediatrics would be inclined to feel that all children need this vaccination. For instance, an incidence of primary infection of 45 in a city the size of New York, or an incidence of 66 even in Minneapolis at fifteen years of age, does not indicate the necessity for the use of the Calmette vaccine. It

indicates only that open cases of tuberculosis are still actively in contact with our young children, and it is quite within the realm of possibility to still further eradicate that intimate contact. Furthermore, the statement that children infected under five years of age are condemned to death is certainly controversial. We see many children under five years of age infected with tuberculosis and, unless subsequently reinfected, so that a malignant, ulcerating, caseous or generalized tuberculosis develops, these children go on and get well. We have seen a good many under one year of age so infected who react positively and give a positive history of infection.

Now, the one fear, Dr. Tice, is the fear of human fallibility. The Luebeck incidence is simply evidence of the fallibility of even the most careful effort. So, I believe that in time this problem should be attacked, as it must sooner or later be attacked, as a research problem and not as a public health measure.

Dr. Sol Roy Rosenthal, Chicago (closing): To answer Dr. Bosworth's question regarding immunity produced by the first infection I offer the following:

1. *Experimentally:* Koch's phenomena (see text).

2. *Clinically:* Notwithstanding the high incidence of the primary complex (about 70-80 percent.—post mortems, Cook County Hospital, Jaffé, the mortality from tuberculosis in Chicago is comparatively low (.057 per 100).

The natural primary infection is produced by virulent tubercle bacilli and although this lesion may be benign at first, it is always a source of danger to the host (Myer). I repeat then, that a primary lesion produced by controlled avirulent organisms would be ideal.

To Dr. Blatt, I wish to say that rigid isolation of the tuberculous patient is most desirable and is practiced in Chicago perhaps more efficiently than in most cities, yet tuberculosis continues to be the great white plague.

The millions of successfully vaccinated children with B.C.G. places this method far beyond the experimental stage.

THE ART OF CANCER THERAPY

E. G. C. WILLIAMS, M.D.

DANVILLE, ILLINOIS

When a utilitarian craft develops its product to the state where efficiency is attended by features that are pleasing to the senses it becomes an art. In most instances where improved methods of manufacture have succeeded in establishing their value prejudices, taboos, ignorance and superstition must be overcome. In the ice trade it took twenty years to convince people that artificial ice is not loaded with ammonia and other chemicals and now the struggle is between mechanical refrigeration and artificial ice to decide whether the new method is safer and more efficient than the old.

General and special surgical practices have become the arts that they are by overcoming the prejudices against anesthetics, fears of hospitals and innumerable superstitions. Obstetrical practice at its best is now an art of the first plane having overcome more superstitions and taboos than any other branch of medicine.

Cancer therapy now lays its claim to consideration as an art because of the perfecting of coordinated methods and the abundant statistical proofs of the results of the application of these methods that are rapidly commanding the admiration and respect of the medical world.

Those of you who have been in cancer work know the bitter struggle against certain superstition and also know that the medical profession at large is not without blame in the perpetuation of these obstacles. Among these are the repeated advice to the patient to let a growth alone until it causes trouble, the indiscriminate cutting into tumors for diagnostic purposes, the idea that a cancer has roots, the idea that x-ray and radium will scatter the disease and numerous others.

In other years cancer therapy was considered the field of the general surgeons and other methods, such as x-ray, radium and electrosurgery were to be found in the anteroom of the morgue and were to be used only to prolong the suffering of a patient after the unsupported surgical attempts had failed. This anteroom period has passed and the men engaged in the various specialties realize that the perfection of the art of cancer therapy depends upon the cooperation of men and coordination of methods. The new approach to treatment of cancer is through a decision on which method or methods to use for any presenting case of tumor growth. The old way was to figure some way a case might be treated by surgery, and if inoperable it was therefore considered incurable, or the Radiologist might save his face by declaring as incurable a tumor which was only not suited for radiation therapy, although possibly operable. Had these same cases been viewed analytically the two methods might have been combined to produce a cured patient. Neither craft can conscientiously condemn the past life of the other.

Illinois State Medical Society, Section on Radiology, May 22, 1935.

Both are guilty of sins of omission and sins of commission.

A forceful presentation of the signs of the changing order was made by Doctor Bloodgood in a discussion at the 1934 meeting of the American Medical Association. To quote the Doctor in part:

"I do not think I have changed from surgery to radiotherapeutics except by the contemplation of facts. That report at my clinic told me that 49 per cent. of the patients previously operated on in the clinic now go to Dr. B and Dr. N for radiotherapy. This is based on results. They are not inoperable; they are still operable. They are not hopeless cases; they are still hopeful, but they get well under radiotherapy. This has happened during the last three years, not because I have changed any but because the method of radiotherapy has changed. A great change has taken place. First of all, radium and x-rays are no longer looked upon as a last resort. Dr. H. and I have lived through that phase of surgery when surgeons were looked on as a last resort. I never saw an appendix removed in Philadelphia when I was a student. I have lived through good surgery, and I am living in the time of good radiation."

Again he said: "I remember my reaction in the beginning to the statements of Pfahler. I did not believe a word he said, but I believe them now, because when I accumulated all the cases of jaw tumors that we had in forty years, Pfahler's name stood next to all the living patients who had irradiation. He was the beginning of Coutard's method. I have seen Coutard. I have sat next to him all day long and have seen cancer of the tonsils and of the base of the tongue after five, seven and ten years. I have seen the same thing happen in Baltimore. In cancer of the jaw I know that I have cured 10 per cent. of my cases by resecting, and the patients have lived for five years, but mighty few of them are alive after ten years. . . I have seen the results abroad. I saw cancer of the rectum with two great men in London. I am now seeing radiation replace surgery, certainly in the mouth. Of course, warts, skin lesions, and lesions everywhere that can be cut out can be taken off without any mutilation, with 100 per cent. results."

And again: "The radiotherapist has to be just as much a pathologist as the surgeon, and I don't know but that he will have to spend less time in anatomy and more time in pathology, because a pathologic point of view will give courage and direction to all who are treating cancer."

The last statement is an expression of the foundation of cancer therapy as an art and a warning to him who would be an artist. The world's masters in cancer therapy were and are fundamentally pathologists. Regaud was a cytologist whose researches in cell behavior led him into the study of various influences upon cancer cells and ultimately into cancer therapy.

In my own research into the value and technique of repercussion radiation the greatest gain has been in the study of cell metabolism and all chemistry.

When the cancer clinic or cancer therapist can get the triple vision for each patient of pathologist, surgeon and radiologist we will get more of the results we desire and less of the consequences we fear.

If we are to hold this work as an art we must look to more in our tabulation of results than eradicated cancers and living patients. We must consider not only the idea of a living patient but one who lives in peace and who is an acceptable member of an active and not overly sympathetic society. We are seeing every day patients who are living but at the cost of unnecessary and avoidable mutilations because the man who treated this patient was surrounded by specters of the past that kept him blind to the possibilities of modern methods of treatment. There are three anachronisms that seem to be the most difficult to subdue. These are the use of escharotic pastes with productions of wide tissue destruction, mutilating block dissection of the face and neck and operation on cancerous tumors without the aid of radiation.

Of these the most brutal and barbarous is the paste racket where patients are toled in for treatment with the idea that they are avoiding surgery.

Block dissections made in the hope that all lymphatic or cancer implanted tissue can be removed are becoming less frequent as they are replaced by supersaturation x-radiation and interstitial radium therapy.

The reports from cancer hospitals, the preaching of such teachers as Dr. Bloodgood and the accumulated figures showing the results of combined radiation and surgical treatment of cancerous tumor seem at times to be having but little effect upon the workings of the surgical mind as the radical breast amputation, resection of the lower lip and other tumor operations continue to be unattended by proper radiation.

The practice of cancer therapy cannot continue indefinitely in the unorganized manner in which it has existed in the past, scattered among the various branches of medical practice. It is rapidly becoming a definite phase of special practice and must be recognized as such, before we

can hope to appreciably lower the present ghastly death rate. This does not mean that the cancer therapist, or whatever he may ultimately be called, will be a law unto himself. Even as the general surgeon is dependent upon the internist, the radiologist, the pathologist, and other workers for his best results, so will the cancer therapist have to be dependent upon his fellow workers. Thus by centralizing responsibility, coordinating methods and directing treatment programs we shall be ready to ask for a name and a christening as an art and as a definite medical specialty.

MEDICAL SURVEY IN MEDICINE.

E. A. KOMINIK, M.D.

CHICAGO

Medical survey, as a branch of medicine, is assuming an increasing significance. Health trends are reflected in and over greater areas and are involving an increasing number of people. Any survey of prevailing conditions ultimately depends in a great measure upon the general practitioner—the man actually in the field of medical problems. We look to him for the accuracy of diagnosis as to the cause of death. Surveys, hence, are delimited in value by the accuracy of diagnosis of physicians. The medical men of today are developing a conscious health trend of mind. This faculty can be shown to benefit, not only the community, but also the working facilities of the medical men themselves.

Statistical data may seem dry and uninteresting but nevertheless as figures are merely symbols representing the past experience of others, portrayal of these symbols in varying relationships will in the end enhance the progress of medicine.

Analysis of present health conditions and trends can greatly benefit programs for prevention of communicable disease. Surveys also serve the purpose of bringing to the laboratory the foundations for scientific investigation. An example of this is the newer data developed and brought to light by Arnold[1] concerning the physiological effects of the menstrual cycle. This investigation was stimulated, no doubt, by a survey of the trend of tuberculosis in the younger female age-groups.

In the survey appended herein, an attempt was made simply to determine the relative status of both the birth and death rate trends in the counties of the State of Illinois. Such factors as the inclusion of non-resident births and deaths, epidemics, corrections for delayed certificates, undoubtedly play a part in increasing or decreasing the various rates. Nevertheless, in the main, the survey portrays the general trend. The rates were obtained from the Department of Public Health bulletins, and of course are subject to the corrections for delayed certificates, as indicated in those bulletins.

Ten years of birth and death rates were studied, starting with the year 1924 and ending with the year 1933. An average of the birth rates and death rates was determined in two five year periods. The last five year period ended 1933 and the previous five year period ended with 1928. The average of the birth rates for the last five year period was then compared to the average of the previous five year period. The same was done for the death rates. It was thought that in this manner the counties could be placed upon a fairly equable basis. We wish here to know *where* the trends of the births and deaths are rising or falling. If we know where, we can later find out, systematically in the same manner, *why* the rates are such. In this way this survey as a basis for an extensive study as to causative factors, serves a purpose.

Furthermore, an analysis concerning the cause of these trends will afford us a fairly comparative health index for all the counties in the State. It is to be hoped that at some time in the future, non-resident births and deaths may be placed in the current bulletins, so as to render as accurate as possible those rates under consideration; that is, if a county is to be judged fairly only the resident births and deaths should be considered. The U. S. Mortality Statistics have these rates dissected as such, but they are not as current as the bulletins.

Birth Rates. The average of the birth rates for the last five year period ended 1933, compared to the previous five year average reveals:

Ten counties or 9.9% of all the counties in the state had an *increase.*

Ninety-two counties or 91.1% of all the coun-

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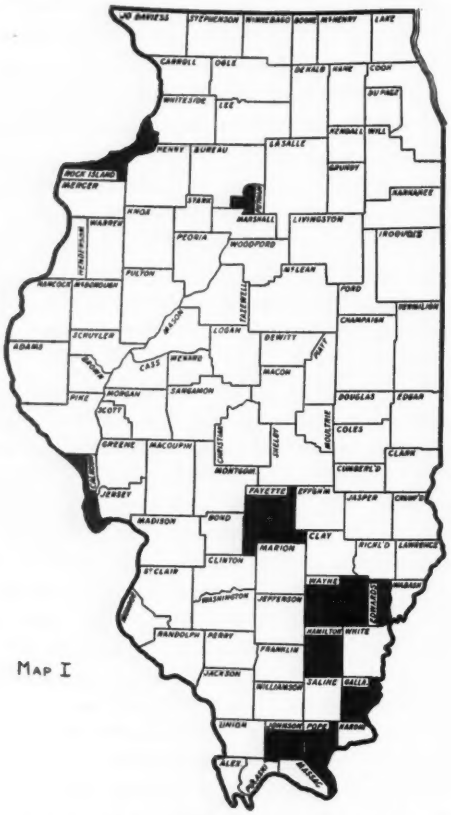
Read before Section on Public Health & Hygiene, Illinois State Medical Society, Rockford, May 23, 1935.

ties in the State had a *decrease* trend in birth rates. (See Map 1. Counties with increased



MAP I

Birth rate trend 1929-1933 average compared to 1924-1928 average.
□ Declining birth rate.
■ Increasing birth rate.

rate, shown in black; those with a *decrease* shown in white). Of the counties showing a birth rate increase, the percentage increase is as follows:

Calhoun	16.7%	Johnson	2.3%
Edwards	1.0%	Pope	2.2%
Fayette	1.2%	Putnam	3.9%
Gallatin	8.9%	Rock Island	9.6%
Hamilton	6.1%	Wayne	1.4%

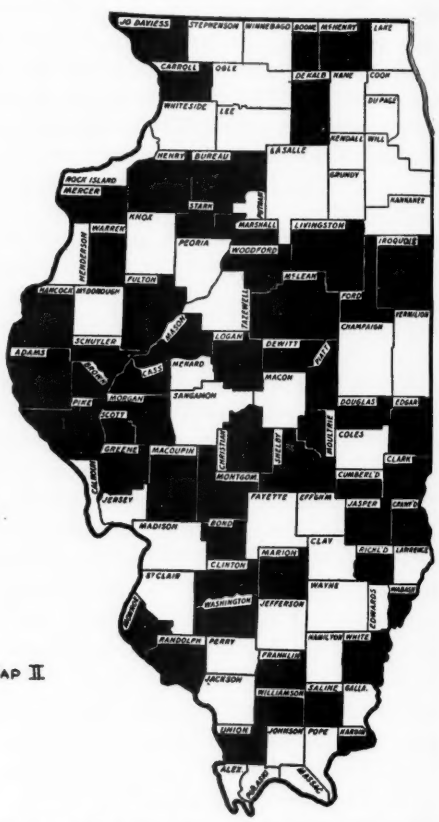
Death Rates. The average of the death rates for the last five year period compared with the previous five year average reveals:

Sixty-four counties or 62.7% of all the counties had an *increase.*

Thirty-seven counties or 36.2% of all the counties had a *decrease.* One county—Stephenson—maintained the same death rate average for the two five-year periods.

Birth Rates and Death Rates. The survey further revealed:

1. Fifty-five counties had a birth rate decrease with a corresponding death rate increase. (See Map 2. Counties in black.)



MAP II

Birth and death rate trend 1929-1933 average compared to 1924-1928 average. Counties in black had a birth rate decrease with a death rate increase.

2. Thirty-six counties had a decrease of both their birth and death rates. (See Map 3. Counties in black.)

Of the fifty-five counties whose birth rate declined and whose death rate increased, the distribution in the various sections of the State were as follows: (Map 2. Counties in black)—

Northern Section: 14 counties, representing 42.4% of all counties in the section.

Central Section: 25 counties; representing 71.4% of all counties in the section.

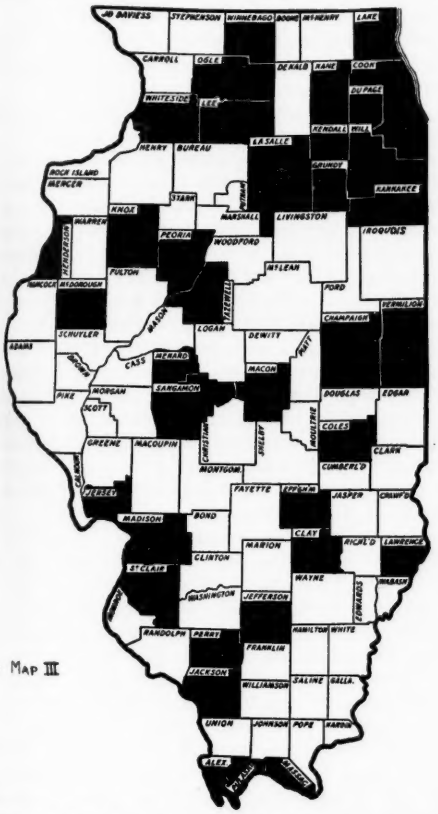
Southern Section: 16 counties; representing 47% of all counties in the section.

Of these same 55 counties having a birth rate decrease with a corresponding death rate in-

crease, the percentage death rate increase in the last five year period over the preceding five year period is as follows:

Counties having a death rate increase of 20% to 26%—Cass, Greene, Hardin, Macoupin, Stark.

Counties having a death rate increase of 15% to 20%—Brown, Clark, Cumberland, Mason, Montgomery, Shelby.



MAP III

Birth and death rate trend 1929-1933 average compared to 1924-1928 average. Counties in black had a decrease of both their birth and death rates.

Counties having a death rate increase of 10% to 15%—Henry, Jasper, Marion, Moultrie, Pike, Scott.

Counties having a death rate increase of 5%-10%.

Bureau	Franklin	Morgan
Carroll	Hancock	Richland
Christian	Iroquois	Schuyler
Crawford	Jo Daviess	Union
De Witt	Logan	Woodford
Ford	Mercer	

Counties having a death rate increase of less than 5%:

Adams	Fulton	Randolph
Bond	Livingston	Saline
Boone	McHenry	Wabash
Clinton	McLean	Warren
DeKalb	Marshall	Washington
Douglas	Monroe	White
Edgar	Piatt	Williamson

For the above group of fifty-five counties, it can be seen that while the trend of death rates is on the increase, it has not reached any undue proportions.

Of the above 55 counties, the average birth rate decrease among them was as follows:

Counties having a birth rate decrease of 20%-25%:—Jo Daviess, Piatt, Williamson, Woodford.

Counties having a birth rate decrease of 15%-20%:—Bond, DeKalb, DeWitt, Iroquois, Livingston, Macoupin, Randolph, Warren, Washington.

Counties having a birth rate decrease of 10%-15%:

Adams	Douglas	Marshall
Carroll	Hancock	Mercer
Cass	Logan	Saline
Christian	McHenry	Stark
Clinton	McLean	Union
Cumberland	Marion	Wabash

Counties having a birth rate decrease of 5%-10%. Bureau, Crawford, Edgar, Franklin, Fulton, Henry, Morgan, Moultrie, Pike, Scott.

Counties having a birth rate decrease of less than 5%:

Boone	Hardin	Richland
Brown	Jasper	Schuyler
Clark	Mason	Shelby
Ford	Monroe	White
Greene	Montgomery	

One county—Putnam—showed a birth rate increase with a corresponding death rate decrease.

In all the counties with the exception of Morgan and Kendall, the averages of the birth rates for the last five year period, are well in excess of the death rate averages for the same period. In Morgan and Kendall counties the situation was as follows:

	Birth Rate Aver. (1933-1929)	Death Rate Aver. (1933-1929)	Birth Rate as a % of Death Rate
Morgan	16.22*	22.80*	71.1%
Kendall	6.76*	9.35*	72.2%

Conclusion. While the trend of the birth rate, for the most part seems to be on the decline, nevertheless the actual averages of birth rates for the last five years is substantially in excess of the death rate averages for the same period. Mor-

*Rate per 1000 estimated population.

gan and Kendall counties were the only ones whose birth rate is actually below the respective death rates. Furthermore, counties in which the birth rate trend is on the decline, and the death rate trend is on the increase, lie mostly in the Central Section of the State. This probably indicates a trend toward a comparatively older population.

The above data assembled as it is, give us a fairly comparative basis or starting point for a comprehensive investigation into the relative health status of the various counties of the State. In pursuing a deeper investigation as to the causes of the trends, due allowance will be made for the various factors, mentioned before, which tend to influence the rates.

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Acknowledgments. I wish to express my appreciation to Mr. B. K. Richardson of the State Department of Public Health for the many courtesies shown me in preparing this paper.

DISCUSSION

Mr. B. K. Richardson, Springfield: This is a very interesting subject Dr. Kominik has discussed in his paper. I have been skating around on the surface of the statistical ice for ten or fifteen years now. I don't profess to be a statistician by any manner of means. In fact, I think it was Dr. Rankin, a former health commissioner of North Carolina, who had been quite prominent in public health matters for many years, who said that there were only two competent statisticians in the United States. He rather implied that perhaps he was one of them. There are very many complicating factors in every statistical study. It is very difficult to take the gross death rates or the gross birth rates and arrive at any very accurate conclusion as to the status of public health on that basis. The birth rate throughout the civilized world has been declining for about fifty years. That corresponds roughly with the advancement in the application of scientific knowledge to the prevention of disease. As methods of control over communicable diseases which affect chiefly the younger age groups have increased in effectiveness, the general age level of the population has risen and consequently there has been a trend towards a somewhat higher mortality in the upper age groups, with a coincident lowering of infant mortality and of childhood mortality. Wherever infant mortality has declined rather rapidly, the birth rate has gone down also. Just why the connection, I don't know. I have never seen anything in the literature that would tend to explain it. With an average span of life of about 60 years in a stable population, you would have a general mortality rate ultimately of about 17. So, in a large population in a State the size of Illinois, or in any large population where the population is stable, and where you have brought the death rate down to around 10 or 12, you are bound to have ultimately an increase in the death rate until we reach around 16 or 17. So, a tendency towards an increased death rate in counties in Illinois or in the State at large would not necessarily reflect poor health conditions. In these counties which Dr. Kominik shows had experience some rise in mortality during the last five years, I believe that a closer study would show that a good many of those are counties with the best prevailing health conditions.

In reference to variations in the birth rate, we made a study, a rather superficial study, a few weeks ago in relation to the economic status as indicated by the proportion of people on relief, and we couldn't find any relation to speak of. If we took the twenty or thirty counties in a group which were highest on the relief rolls in general the birth rate was a little higher than it was in the State at large or in the counties lowest on the relief rolls, but a close analysis showed that wasn't universal by any manner of means.

In Winnebago county, for example, there was at the end of last year a rather high proportion of people on relief; about 20 per cent. At the same time this county had one of the lowest birth rates in the State and also had a very low death rate. Calhoun county, which had one of the highest birth rates in the States, was in the second class from the top on the relief rolls. So, it didn't work either way.

Economical conditions don't seem to be altogether responsible for this variation in the birth rate, and it is quite a difficult thing to determine just what the factors involved are. However, since 1922 the general birth rate in the State has tended downward, as it has throughout the entire world. It appears to have reached the bottom, however, in 1933. In 1934 it rose some. So far this year it appears to be considerably higher than it was even in 1934.

About a year ago we made an analysis of the mortality from heart disease by counties in Illinois. We found that the counties with the highest rates were rather widely distributed throughout the State. We rather thought that the age level in the southern part of the State was higher than it was up in the northern part because that territory down there has been settled for a good deal longer period of time than it has in the northern end of the State and even in the central part of the State. Upon an analysis, however, we found that the mortality from heart disease correlated exactly with the age level of population, regardless of the location of the population. Whether it was in the southern part, the central part or the northern part, there was a direct relation. Where the mortality from heart disease is high, you have a high age level of your population. So that I think that Dr. Kominik's conclusion that trends towards higher death rates in a large number of counties are probably correlated with the increasing age level of the population.

He mentioned Morgan county as having a higher mortality than birth rate. I think that is explained entirely by the location there of one of the largest

State hospitals in the State with a relatively small population in the county. We have studied the situation from year to year and find that if the State hospital population is eliminated from consideration, they have in Morgan County quite a normal death rate and quite a normal birth rate as compared with the rest of the State.

Just what influences are at work in Kendall county, I don't know. We have been very much interested in that county. I rather suspect, however, that there is a hospital or some institution very close to the border but located in another county. It is a small county and they persistently have a higher death rate from year to year than a birth rate. With a small county a relatively few deaths, perhaps ten or fifteen deaths, that occur outside the county would change entirely the picture of the death rate in that county. I think that that same explanation would probably apply to a number of other counties in the State. It has always shown up very clearly in reference to municipalities. In Moline, you have a much higher birth rate on the face of gross returns that you have in Rock Island or East Moline. That is explained by the fact that a maternity hospital is located in Moline, just across the boundary line between Moline and Rock Island, which is all one community. A good many maternity cases are taken care of from Rock Island. When those are classified according to residence the whole community has quite a normal birth rate and quite a normal death rate.

Those factors come into play always in taking gross mortality and gross birth rates for determining trends in health conditions.

I want to compliment Dr. Kominik on this paper.

Dr. N. O. Gunderson, Rock Island: I would like to ask whether it is going to be possible eventually to allocate these births to the proper place so as to give us a true birth rate.

Dr. John J. McShane, Springfield: In reference to Mr. Richardson's statement regarding birth rates, I might state that the same thing applies to Moline as applies to Cicero. Cicero has no hospital within the city limits and many maternity cases go to the hospitals in Oak Park, and these births are credited to Oak Park due to the fact that the birth occurred in the Oak Park registration district.

In studying birth statistics it was noted that the Cicero birth rate was not as other cities and upon making inquiry we learned that a number of births that should have been credited to Cicero, had the baby been born in Cicero, was credited to Oak Park, due to the fact that the mothers, as I stated previously, went to maternity hospitals in that city.

Dr. John J. McShane, Springfield: I have talked to Mr. Howard about this matter, and I hope in the near future we will be able to allocate deaths to the place of residence. In Springfield or any city where there are superior hospital facilities, many cases of communicable diseases are hospitalized. In Chicago many cases are brought to the Cook County and other contagious disease hospitals from outside the city, and if these cases die in the hospital in Chicago, they are charged to the city of Chicago. The same applies in Springfield. Each case of typhoid fever is hospitalized in our local hospitals, and if a death occurs the death is charged to the city of Springfield, whereas it should be charged to the place of residence. We hope that this situation will be taken care of in the near future, as these deaths really should be charged to the township, village or city in which the patient lives.

In New York State, if a man dies in Buffalo and he resides in New York City, his death is charged to New York City, and if a person dies in New York City and he lives in Albany, his death is charged back to his home city.

As I said in the beginning, I hope in the near future we will be able to allocate deaths to the place of residence. When we do we will have more accurate statistics regarding deaths that occur from communicable and other diseases.

Dr. Kominik (in closing): One of the largest factors in the reflection of the birth and death trends is due to the fact that there is no proper accrediting of births and deaths in the various localities. When that is corrected the trends will reflect more closely conditions as they exist in various localities.

VITAMIN REQUIREMENTS IN PREGNANCY

W. C. DANFORTH, B.S., M.D., F.A.C.S.

EVANSTON, ILLINOIS

Associate Professor of Obstetrics and Gynecology, Northwestern University Medical School, Chicago

Chief of Division of Obstetrics and Gynecology, Evanston Hospital

The relationship of the vitamins to the reproductive function has assumed a more and more important position as their importance in the problems of nutrition has become better understood. There is still much which we do not understand and the fact that no method has been devised for the estimation of the amount of any given vitamin in various foods places us somewhat at a disadvantage in determining the relative values of food. The exact quantitative vitamin requirements of the animal organism also cannot be stated.

The very small quantities of vitamins which are needed to produce the changes which are caused by them causes us to believe that they function as catalysts of the chemical processes of the body rather than as the materials from which molecular structure is built up. This suggests that, beyond the amount of vitamin needed to catalyze the chemical process, the ingestion of larger amounts is of little value. It is probable that the value of the use of large amounts of vitamin containing substances has been over-rated.

In discussing the vitamins which are especially important to the reproductive function it should also be borne in mind, in addition to those which are particularly useful in various specific ways to the process of reproduction, that the organism as a whole must be considered, as a condition of vigorous health is essential to the most efficient carrying out of the reproductive process. The obstetrician must consider the vitamin requirements of his patients not only from the standpoint of the pregnant woman but also from that of the child. There is a relationship between vitamin requirements and lactation. In at least some of the large number of cases of sterility with which the gynecologist and obstetrician has to deal the question of a possible lack of certain vitamins arises. While much yet remains to be made clear certain relationships between the vitamins and the process of reproduction seem well established. A proper appreciation of such information as is at present available concerning the influence of vitamins upon sterility, pregnancy and lactation, appears to have been added to the duties of the obstetrician and gynecologist.

The frequent cases of sterility with which we have to deal tax our therapeutic resources and often we fail to produce the greatly desired result. Every case of sterility requires a careful study of both members of the family for the experience of many observers indicates that about 40% of sterilities are due to abnormalities in the male. The vitamins which are of particular importance from the standpoint of sterility are A and E. At least in experimental animals changes in the reproductive system due to deficiency in vitamin A have been demonstrated. Epithelial changes in the reproductive system are found. In the male, as a result of keratinization of the germinal epithelium, spermatogenesis is retarded or inhibited. Male sterility may therefore result but if the deficiency in vitamin A is overcome regeneration occurs and normal sperms may be produced. This may require from five to thirteen weeks. In the female, sterility is probably due to failure of the ovum properly to implant itself upon the uterine lining. This also may be corrected by the giving of vitamin A containing foods or substances. There appears to be evidence which justifies us in believing that an adequate vitamin A supply is needed during lactation. If the mother's diet does not contain an adequate supply, measures should be taken to provide an additional amount. It may be obtained from cream and butter and is also present in haliver oil.

Vitamin A is soluble in mineral oil and the amount which the body obtains may therefore be materially decreased if it is being taken as mineral oil is insoluble. When mineral oil preparations are being used regularly the influence of their frequent or constant presence in the alimentary tract upon vitamin absorption must be considered. Deficiency of vitamin A appears responsible for certain changes in mucous membranes and perhaps for lowered resistance to some infections. This may interest us as obstetricians as any respiratory infection in a pregnant woman is rather more of a source of anxiety than in the non-pregnant. Renal calculi will develop in experimental animals if an obstruction to urinary outflow exists and changes in the renal epithelium may be seen. This again is of importance in the field of obstetrics as infections of the pelvis of the kidney are troublesome and sometimes serious complications of pregnancy.

Vitamin E has an important relationship to sterility. It has a very definite effect upon the causation of sterility which caused it to be discovered. In experimental animals it is found that, when vitamin E is absent, in female animals resorption of the embryos occurred, although no demonstrable changes in the reproductive organs took place. The entire effect of lack of this vitamin in the female appears to be upon the product of conception rather than upon the mother. This is susceptible of correction in the female by the administration of vitamin E containing substances. In the male there is a degeneration of the germinal epithelium. These changes cannot be restored if the process has gone on to any extent. This is contrast to male sterility resulting from deficiency of vitamin A in which restoration may take place after supplying the deficient vitamin, provided infection following the degeneration of the epithelium has not caused too great destruction. A greater amount of vitamin E is needed by the male to prevent the tissue changes which cause sterility than is needed by the female to prevent the absorption of embryos. When the degenerative changes in the reproductive system of the

male have reached a stage from which functional recovery is no longer possible the secondary sex characteristics are not lost. It would appear, therefore, that the male sex hormone is not secreted by the germinal epithelium.

In the female, ovulation will proceed normally in the absence of the vitamin and the cell structure of the ovary appears unimpaired. The sterility results from the fact that the embryos cannot survive in the absence of vitamin E and are resorbed. Development proceeds up to the stage of the blastodermic vesicle and, up to this point, development goes on without the vitamin. Death and resorption of the embryo follows and this may be prevented by the administration of vitamin E at or before this time. As one large dose may cause the pregnancy to continue normally it would appear that the vitamin is stored within the body.

Evans and Burr have described a paralysis of the limbs in the young of experimental animals whose diets were merely sufficient to complete pregnancy and which were deficient in vitamin E during lactation.

It has been rather clearly shown therefore that in laboratory animals belonging to the class of small rodents, vitamin E is definitely necessary in the process of reproduction and that its absence in lactating mothers is productive of changes in the nervous system of the young. These paralyses in the young may be prevented if vitamin E is present in the mother's diet which indicates that it passes to the young in the milk. In view of these facts it has been assumed that vitamin E deficiency may play a part in certain cases of human sterility and that administration of vitamin E is indicated. This vitamin is now obtainable commercially in the form of preparations of wheat germ oil. Proof is still lacking of the value of this form of therapy in habitual abortion in human beings, but, as the administration of vitamin E is wholly innocuous, it seems wise to try it in such cases until experience shows whether results may be obtained in habitual abortion and in human sterility which are comparable to those attained in animals. It is at least well worth trying in view of the rather definite experimental findings. The treatment of sterility is still discouraging as the most painstaking work with these cases yields but a modest number of pregnancies. Anything which gives promise of improvement in our results should be seriously considered. To determine whether vitamin deficiency causes structural changes in the mammary glands which would influence lactation. Urner studied the effect of deprivation of vitamin E upon the mammary glands of the pregnant rat. No specific histologic change was noted. The involuntary changes are probably due to the destruction of the product of conception.

Vitamin D influences growth both in laboratory animals and man. Lack of this vitamin results in deficient calcification causing the production of soft fragile bony structure. The bony changes are most marked at the epiphyses. Hess and Weinstock have shown that the administration of vitamin D during pregnancy does not protect the infant against the development of rickets after birth. The management of rickets after birth is a paediatric problem. Vitamin D exerts a definite effect upon calcium and phophorous absorption and for this reason an adequate supply should be provided for the pregnant woman. In warm weather simple exposure to the sun provides an efficient and inexpensive method of providing the needed vitamin from her own tissues, but in winter, particularly in the colder parts of the country the administration of viosterol is of great value and particularly if combined with calcium and phophorous. The diphosphate of calcium is a useful source of both these substances. Richardson believes that viosterol is of value during pregnancy for the relief of tetany. This is probably because of its effect upon calcium metabolism. It is clinically demonstrable that the muscular pains of which the pregnant woman frequently complains are often relieved by the administration of calcium. A proper supply of vitamin D is important to the pregnant woman and care should be taken, especially when exposure to sunlight is limited, to supply the needed vitamin artificially.

It is probable that vitamin D exercises a marked effect upon calcium and phosphorus metabolism. This function may have an important bearing upon osseous development of the infant in utero and some workers believe that it aids in maintaining tooth structure. Whether it influences the teeth or not, the fact of its infant in utero and some workers believe that it lism seems established. As both of these minerals

are of importance to the pregnant woman and nursing mother the value of an adequate supply of vitamin D seems apparent.

It has been recognized for centuries that men deprived of fruits and green vegetables, and restricted to meat, particularly salt meat and dry foods, would develop scurvy and that fruit juices and fresh vegetables would produce a rapid cure. This disorder we know now to be due to a lack of vitamin C and its rapid relief to the fact that this vitamin is contained in fruits and vegetables. Canker sores and some dental lesions are apparently allied to the more serious condition known as scurvy. Dental caries progresses more rapidly during pregnancy than at other times. This process, and inflammatory conditions such as gingivitis, are apparently benefited by the use of vitamin C. This may be obtained in orange juice, lemon juice, fresh tomatoes and green leaf vegetables taken raw such as lettuce and cabbage. We have for some years tried to have our private obstetric patients follow this plan and believe that we have been able to decrease dental caries. Milk contains a considerable amount of vitamin C immediately after obtaining it from the cow but probably but little by the time the milk reaches the consumer. It is therefore not an adequate source of this vitamin. Vitamin C is probably easily destroyed and the foods containing it must be taken in generous amounts. Hanke, who studied the effects of the administration of citrus fruit juices upon the gingivitis and dental caries of children, recommended a pint of orange juice and the juice of one lemon per day. He states, however, that the amounts needed to exercise a curative effect are larger than those needed to maintain an existing state of health. A tumbler, which is about six ounces of orange juice and a generous diet of lettuce daily seems to be sufficient to maintain a state of dental health. Fortunately orange juice can be taken by most people daily for indefinite lengths of time without its palling upon them. Urner gives an excellent summary of the influence of the action of the vitamins during pregnancy and lactation and I shall quote from him:

Vitamin A affects the fertility of the experimental animal even when deprivation is moderate. It may affect the development of the embryo if the deprivation is severe. It is of importance in maintaining resistance to infection. Whether this protective effect extends to puerperal sepsis is questionable.

Vitamin B is needed for ovulation in the experimental animal. Male sterility caused by degenerative changes in the germinal epithelium has been noted in experimental animals deprived of this vitamin. Vitamin B and its component, G, are needed for lactation and adequate amounts are essential.

Vitamin C is needed for successful continuation of pregnancy to term in experimental animals. When inadequate amounts are provided scurvy results. To this is probably related gingivitis and possibly dental caries, both of which appear to be beneficially affected by the use of vitamin C. Vitamin E is required for the proper development of the embryo and is also needed for the proper nutrition of the suckling young. An increased amount is needed during lactation.

Vitamin requirements can, for the most part, be supplied through the diet. The provision of a well balanced dietary is an important part of proper pre-natal care.

THE TRACHOMA SITUATION IN SOUTHERN ILLINOIS

H. S. Gradle, A. F Lenzen and A. M. Hayden

CHICAGO

During the early part of the preceding century, settlers from the Eastern Seaboard migrated westward to what was then called the Western Province of Virginia. They settled around the junction of the Ohio and the Mississippi Rivers and spread out into the hills of Kentucky and on to the plains of Missouri and Illinois. The descendants of these early settlers still form the main portion of the population of this territory, as the foreign emigration passed this part of the country by. When trachoma first made its appearance in this area is unknown, but ophthalmologists have known of the existence of the disease there for at least forty-five years. The late Dr. Stucky started the campaign in the Kentucky hills and his early efforts are being carried on in the endeavor to control the scourge there. In Missouri, the United States Public Health Service is fighting the disease and apparently gaining the upper hand.

In Illinois, trachoma is fairly well confined to the southern fourteen counties of the state. How many cases there are cannot even be conjectured for no comprehensive survey has ever been made. In four of the countries, the Illi-

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nois Society for the Prevention of Blindness made two surveys, spaced ten years apart, and found that the number of cases had not decreased in the single decade. No effort, either private or governmental, had ever been made to alleviate the conditions there or to prevent the spread of the disease, and it was rather evident that the wave of trachoma was advancing slowly toward the north. There were no Eye Clinics in the southern end of the state and a few of the worst cases were sent to the Eye and Ear Infirmary in Chicago, a most unsatisfactory method of procedure, on account of the distance of that Institution from the trachoma regions and the consequent homesickness of the patients.

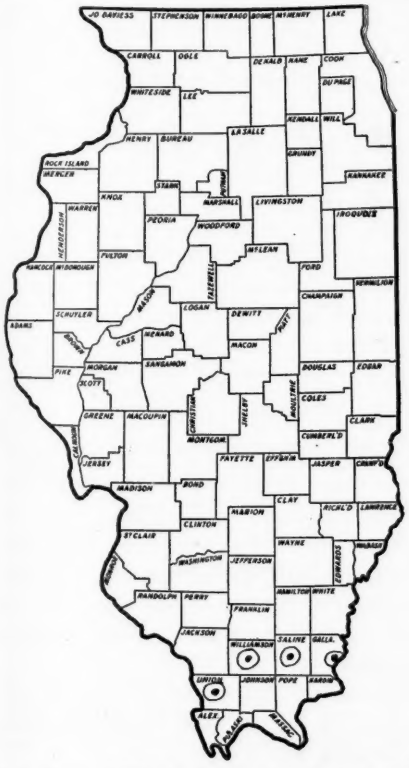

Fig. 1. State of Illinois showing location of clinics.

These facts were laid before Governor Horner shortly after his inauguration and he took immediate steps to finance a campaign for the control of trachoma in the southern counties. The Illinois Society for the Prevention of Blindness contributed most generously, both in money and personnel. The State Board of Health and the Department of Public Welfare, particularly through the Illinois Eye and Ear Infirmary, contributed their quota of work, and on June 18, 1934, the Governor Horner Trachoma Clinics were opened. At this time, the Illinois Emergency Relief Commission was functioning and, due to the splendid cooperation of this body, some of the nurses and nearly all of the non-technical personnel connected with clinics were furnished as a relief project.

Reference to the accompanying map will furnish a geographical concept of the territory covered, and of the counties that were served by the Clinics. Out-patient Clinics were started in Harrisburg, Shawneetown, Marion and Jonesboro. Space was provided by the local authorities in the public libraries or the courthouse, so that each Clinic had a waiting room, a treatment room and an operating room. Uniform equipment was placed in each Clinic so that the personnel could function smoothly in any one of the four locations. Two nurses were assigned to the two eastern clinics and two nurses to the two western clinics, all under the supervision of Dr. Lenzen. Each clinic was operated for one full day each week, with the physicians and three nurses on duty, and for one-half day with the same personnel, and for one-half day with only one nurse. The remaining time of the nurses was spent in treatments and home visits. In addition to the medical personnel, each clinic had the service of stenographers, social service workers, janitors, and scrubwomen. Operations were performed in the Clinics on given days by appointment.

But little publicity was required, for news of the establishment of the clinics spread rapidly by word of mouth and the clinics were soon operating at capacity. Each new case was questioned very carefully, not only as to medical history, but also in regard to the social status. Great care was exercised not to accept patients who were under the care of private physicians or patients whose financial condition was such that they could engage the services of a private physician. Of course, only cases with trachoma were accepted for treatment. All others who reported to the clinics were examined carefully and either released as non-trachomatous, or else listed as trachoma suspects and re-examined at a future date. Surveys were made of several of the schools as possible nests of infection and all children with trachoma were referred to the

clinics for treatment. Careful records, both medical and social, were kept in every case and this paper is based upon an analysis of those

Four hundred and ninety-seven of these patients had had previous treatment elsewhere. It was not only of interest, but also of great

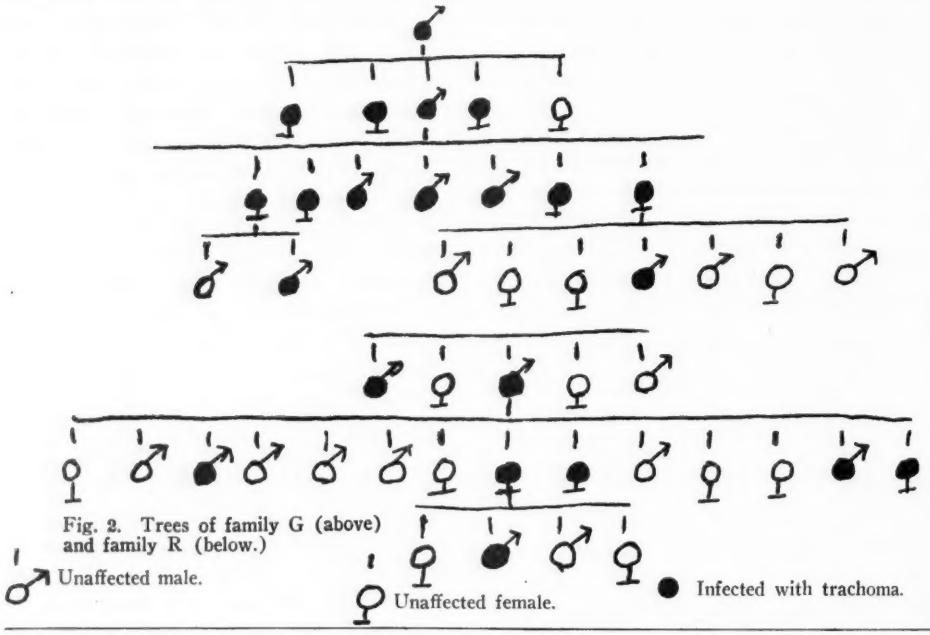

Fig. 2. Trees of family G (above) and family R (below.)

records. The period of this report covers from *June* 18, 1934 *to June* 18, 1935.

Total number of Positive cases of Trachoma was 933. Of these, 549 were males and 384 were females.

The ages of the patients were as follows:

From 1 to 9 years inclusive	98
From 10 to 19 years inclusive	151
From 20 to 29 years inclusive	90
From 30 to 39 years inclusive	76
From 40 to 49 years inclusive	152
From 50 to 59 years inclusive	164
From 60 to 69 years inclusive	115
From 70 to 79 years inclusive	73
From 80 to 89 years inclusive	14
Total	933

The length of time that the condition has existed in each case previous to admission is of import, both from the preventive standpoint as well as the therapeutic. From such information, the word of the patient had to be relied upon and as nearly as could be estimated, the following condition pertained:

Trachoma present for one month or less	92 eyes
Trachoma present for two to six months inclusive	82 eyes
Trachoma present for seven to twelve months inclusive	130 eyes
Trachoma present for more than twelve months	1,298 eyes
No record of length of time condition existed	264 eyes
Total	1,866 eyes

importance to determine the number of members of each household from which a patient came, who were afflicted with trachoma.

In 631 cases, the patient was the only member of the household affected.
In 169 cases, two members of the household were affected.
In 81 cases, three members of the household were affected.
In 31 cases, four members of the household were affected.
In 9 cases, five members of the household were affected.
In 6 cases, six members of the household were affected.
In 6 cases, eight members of the household were affected.

In this connection, it may be of interest to reproduce two family trees, showing the number of cases of trachoma through the different generations.

In order to simplify the keeping of records, we classified the condition of the trachomatous conjunctivae as

Stage 1. Acute — succulent—purulent—follicular—granular.

Stage 2. Hypertrophic—hyperemic.

Stage 3. Beginning scar formation with chronic inflammation.

Stage 4. Quiescent scarred condition.

It was of course, impossible to classify each case accurately, as one stage is apt to overlap into another, but holding to the classification as

accurately as possible, the following was found on admission:

Stage 1	834 eyes
Stage 2	94 eyes
Stage 3	55 eyes
Stage 4	795 eyes
Unilateral Trachoma	24 eyes
No record	64 eyes
Total	1,866 eyes

The fact that the disease had existed for such a long time in so many of the cases was responsible for the large number of complications that were found, upon admission.

Trichiasis existed in	483 eyes
Entropion was present in	225 eyes
Pannus had formed in	905 eyes
Active corneal ulcers were present in	35 eyes
Corneal scars were present in	441 eyes
Total complications	2,089

Inasmuch as the preventive phase of the work was to be emphasized as well as the therapeutic, it was of import to have as accurate a record as possible of the visual acuity upon admission to the clinics as well as upon completion of the treatment. All visual acuities were measured at a twenty-foot distance with a standard test chart and minimum illumination of seven foot candles.

Vision of 20/20	565 eyes
Vision of 20/30 to 20/40 inclusive	293 eyes
Vision of 20/50 to 20/60 inclusive	118 eyes
Vision of 20/70 to 20/100 inclusive	291 eyes
Vision of 20/200	143 eyes
Vision of less than 20/200	375 eyes
Impossible to obtain vision	45 eyes
Amaurosis	36 eyes
Total	1,866 eyes

It should be noted that the number of eyes with vision of less than 20/200 and amaurotic eyes total 411, or *exactly 22% of the total.*

Nine hundred and thirty-three pateints were diagnosed as trachomatous during the year covered by these records. Of that number, 12 were referred to private physicians because of their economic status and were given no treatment in the clinics. Three were too ill to come to the clinics after the first visit and were not seen again. In one case, both eyes had been enucleated and the conjunctivae were such that no treatment was advised. That left 917 patients that were given treatment of which there were ten main types. The greatest reliance was placed upon chalmoogra oil massage, but in some it was combined with the use of other medication. A few cases were treated with quinine bisulphate alone and in some it was combined with zinc ionization. Others were treated with glass rod massage. Every patient was given a 1-5000 aqueous solution of oxycyanide of mercury to use as an eyewash two or three times daily at home in addition to the treatments given in the clinic. Considerable stress was laid upon that as a preventive of secondary infection. To summarize, the 12,092 treatments that were given in the clinic were divided as follows:

	Patients
Chalmoogra massage alone	474
Chalmoogra massage plus Quinine Bisulphate	33
Chalmoogra massage plus Quinine Bisulphate plus Zinc ionization	3
Chalmoogra massage plus Zinc ionization	14
Quinine Bisulphate alone	11
Oxycyanide of Mercury alone	346
Glass rod massage	6
Finger massage	1
Copper Sulphate	1
Mixed Treatment	28
Total	971

The maximum number of treatments given any one patient was 115. No reference will be made here to the comparative value of the various forms of treatment as that will form the basis of another paper of a non-statistical nature.

Operations were performed in the various clinics as requisite, using both local and general anesthesia, as follows:

Expression	112 eyes
Modified Ewing	69 eyes
Hotz	39 eyes
Canthoplasty	46 eyes
Cautery puncture	30 eyes
Spencer-Watson	5 eyes
Gaillard Suture	11 eyes
Grattage	44 eyes
Lip graft	3 eyes
Diathermy Peritomy	10 eyes
Electrolysis of lashes	11 eyes
Pterygium	14 eyes
Chalazion	11 eyes
Tear sac Extirpation	1 eye
Excision of Scar Tissue	1 eye
Sling Suture of Outer Canthus	1 eye
Excision of Multiple Calculi	10 eyes
Tear Sac Puncture	1 eye
Incomplete Expression	9 eyes
Entropin	1 eye
Excision of Sebaceous Cyst	3 eyes
Cilia Removed	1 eye
Plastic Operation on Canthus	1 eye
Plastic Operation	1 eye
Forcible Dilatation of tear passages	1 eye
Total operations	436

The final vision was recorded in 478 cases. Accepting the viewpoint that vision of 20/50 or better is required for satisfactory reading ability and that 20/200 or better is required for ordinary labor, the improvements in vision that

followed treatment may be classified as follows:

Vision became worse during treatment.....48 eyes or 5.02%
Vision improved from less than 20/50 to 20/50 or better.....96 eyes or 10.04%
Vision improved from 20/200 or less to between 20/60 and 20/200.....67 eyes or 7.00%

The economic status of the patients is a matter of more than passing interest and according to the best information possible, the new patients at the clinic for the past year fell into the following classes:

486 were on relief, of which number
465 were getting relief from the I. E. R. C.
10 were in C. C. C. camps or supported by someone in camps.
6 were on the Blind Pension Roll.
5 were receiving War Pensions.
284 were self supporting.
45 were subsisting on farms, but without any ready cash.
12 refused information as to their means.
15 had no income and were living with relatives.
91 were in the unclassified list.

933 Total.

In the self-supporting group of 284, the average weekly income for the family was $10.05, the maximum being $26.00. The size of that average family was 4.63 individuals, which yielded an average individual weekly income of $2.17. In this connection, it might be of interest to note that the Blind Pension Roll of the fourteen Counties that are served by these clinics contains 615 names. Inasmuch as the statistics of the Blind Pension are of no value from the scientific standpoint, it is impossible to say how many of these cases are blind due to trachoma.

The territory served by these clinics is distinctly rural, with scattered small towns. It was found that of the 933 patients seen in the first year of the clinics, 183 lived in the communities where the clinics were held. The remainder lived at varying distances away, the average being 16.1 miles and the maximum 56 miles. Thus the transportation problem for these patients is a serious one. Many are hauled in by friends. Some come in buses that the I.E.R.C. operate. The majority hitch-hike or walk. For example, one family with four trachomatous members, lived 22 miles away from the nearest clinic. A— of that family came for 32 treatments, B for three operations, C for 45 treatments and D for 54 and every mile of that distance was covered on foot. Innumerable such examples are available, but do not lend themselves to any statistical analysis.

Summary. On June 18, 1934, four out-patient clinics for the care of indigent sufferers from trachoma were opened across the southern end of Illinois. These were made possible through the understanding and generosity of Governor Henry Horner.

During the first year, 933 cases of trachoma were diagnosed. Four hundred and fifteen of these cases were under 40 years of age, indicating the necessity for a long-continued campaign.

Of the 1,866 eyes seen, the condition had existed for one year or less in 304 eyes, the remainder being more than a year old.

In 302 cases, more than one member of the household had trachoma.

The number of eyes in the various stages of the disease and the complications that existed upon the admission are enumerated.

Twenty-two per cent. of the total number of eyes had less than 20/200 vision.

The methods of treatment and the total number of treatments are analyzed, but without discussing end results.

The visual end results of 478 cases with completed records were analyzed with the finding that 5.02% of the eyes lost some vision despite treatments; 10.04% of the eyes improved to 20/50 or better; and 7.00% of the eyes improved to 20/200 or better.

Only 329 of the patients were self-supporting and the remanider were dependent upon some form of charity. The average income of the self-supporting patients was $10.05 per week for the entire family that averaged 4.63 individuals.

FIRST AID IN EYE INJURIES

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Inasmuch as the most efficient first aid is prophylaxis, with your indulgence we will not limit our discussion wholly to treatment of injuries already sustained.

Some 16 months ago several of us Chicago Eye Physicians cooperated to produce an exhibit for the American Medical Association Convention on this same subject. Some of the same features were used this past summer in a second exhibit. It is the ideas of these exhibits that I wish to bring before you tonight. Dr. Glen. Nethercut is cooperating with me at this time by

(Read before the Chicago Medical Society October 30, 1935, in symposium on iritis.)

bringing to your attention the essential features of these exhibits.

The subject is most easily handled by dividing it into age groups.

In the first place malformations and prenatal disease can be reduced to a minimum by careful check of both mother and father before conception. If both are healthy, and if the mother remains healthy during pregnancy, there will be little chance of congenital or prenatal disease or injury.

During delivery accidents happen to eyes. Forceps, fingers and pus are the main offenders. If the delivery is preceded by thorough cleansing little need we fear pus. Still if silver nitrate is used á la Credé no harm results and there is established a habit which has been known to save many eyes. Credé's treatment may cause a swelling and discharge for a day or two, but this is seldom severe, and almost never lasts over two days.

Forceps can press upon an eye and cause slight or severe injury, from a small subconjunctival hemorrhage to rupture of the eyeball. The finger or gauze may be drawn across the face in such a way as to open the lids and even scrape the cornea. Thorough cleansing with the mildest of antiseptics such as half saturated boric acid solution, repeated as necessary but not too frequently, is probably the most satisfactory treatment. It must be remembered that the eye, especially that of an infant, is a most delicate structure, and it should be handled with proper regard. Ordinarily it is not necessary to use large instruments to evert the lids or reach every cranny of the conjunctival sac. Instrumentation is harmful, and unless it is definitely indicated, it is inadvisable.

When trauma to the eye has occurred, thorough examination is indicated. To view the palpebral conjunctiva one need only pull the lids apart with the two thumbs. Should the skin be slippery a bit of gauze over the thumbs suffices. A simple manipulation of the thumb on the lower lid, pressing slightly on the eyeball will push the eyeball back into the orbit and the conjunctival fornices will be pushed outward into view and can be treated with an albuminate of silver or boric irrigation (a soft tipped rubber ear syringe is ideal for this).

The cornea in both these manipulations will be covered. In order to expose it, it is necessary to start again. We use a small Desmarre's lid retractor for the upper lid and the thumb on the lower lid. Under these conditions 1% or 2% sol. of Potassium fluorescein may be instilled and washed out, to demonstrate defects in the corneal epithelium.

Of course, in all these manipulations the hands and all instruments touching the eye must be aseptic, as post partum infection may occur. The mother must be instructed in this technique.

Should conjunctivitis occur, a smear and a culture should be taken at once, and if positive for Neisserian, the case should be taken to a hospital where special attention is given to the treatment, e.g. Cook County Hospital. This treatment does not properly fall into our discussion, as it is not strictly first aid. If the infection is not Neisserian, mild antiseptics are best unless corneal complications occur. Consultation is always in order.

When the child begins to creep there should be a special pen for him with a special floor free from the dust and dirt from the shoes of older children and adults, until the baby can be taught not to get his fingers into his eyes. But it is remarkable without these contrivances how little infection takes place. This is due to the anatomical arrangement of the lids and the character and course of the tears. Should sand or other foreign body get into the eye, pull the upper lid over the lower; this may dislodge the foreign body or start the tears which may wash it out. This failing, irrigate with boric acid. The trick lies in holding the child properly. His head should should be steadied between the doctor's knees, and the body of the child should be on the nurse's or mother's lap; the legs held by the nurse's elbows and arms, and the hands by the nurse's hands.

Of course sharp toys (scissors, ice picks, knives, needes, pins, darts, etc.) will not purposely be left in the child's path. But if his eye is injured, it may be washed only with *sterile* boric acid solution. Should this not be available do *not* substitute. Merely apply a clean bandage and call an eye physician. Too little attention is better than too much. Should an eye physician not be available, the eye should be handled by a surgeon under the most aseptic conditions available.

Recently I have seen several examples of that most heart-rending accident prevalent among school children, a bent pin, or a bit of broken copper wire penetrating the cornea. These had

been shot by rubber bands; in each case, the cornea and lens were penetrated, cataract naturally resulting. Infection often follows. First aid treatment consists in removing the foreign body, applying a mild antiseptic ointment, such as 1:3000 bichloride of mercury, between the lids and covering the eye with a light aseptic dressing. The subsequent care of such a case is often prolonged and complicated; again consultation is in order.

In adults foreign bodies may require first aid treatment. If a cinder lodges under the upper lid, it is usually easily removed with a sterile applicator moistened with boric acid. Have the patient open both eyes, look down, and refrain from raising his eyebrows. Take the eyelashes of the upper lid with thumb and first finger, pull the lid away from the eye, press gently with a pencil or the reverse end of the applicator on the center of the upper lid, and simultaneously lift the eyelashes and press them gently against the eye. A cinder on the cornea is not so easily removed. The eye must be anesthetized. Pantocaine 0.5% to 1% is the most popular anesthetic at present. Two drops at an interval of two minutes will usually be sufficient to allow the application of a spud. A spot light is necessary. The technique should be acquired by personal instruction from a competent man.

Automobile accidents are increasing, and although safety glass is now fairly standard we do have many eyelids torn. These should be accurately repaired at once if the eye itself is not badly damaged, or if an eye physician is not available within a few hours. Otherwise a boric acid dressing is proper.

Should there be a penetrating wound, an x-ray should always be made. Even glass may cast a shadow (if it has enough lead in it). Dr. Wilder always made it a practice to fasten a spicule of the glass suspected of being in the eye, to the side of the nose or cheek, when having the x-ray taken, to demonstrate the opaqueness of the glass.

Goggles have greatly interfered with surgical ophthalmology. But even yet we must use the magnet on occasions, to remove magnetic foreign bodies from eyes. The sooner this is done the better; until this is done, the first aid treatment is atropine and bandage.

For burns of the eye, one should immediately dilute with quantities of tap water preferably from the hot tap (as water that has passed through a boiler is more sterile than otherwise). If the burn is from an acid and a *mild* alkaline eyewash can be obtained within 30 seconds use it. Not long ago I saw a technician who splashed one drop of tenth normal sodium hydrate into her eye. She immediately washed it out with an ounce of tenth normal hydrochloric acid. The result was an unnecessary and severe acid burn.

Pieces of mortar or slacked lime occasionally get under the lids. Immediate treatment is rapid dilution with tap water, and this can be more thoroughly done if the eye is anesthetized with cocaine or one of its substitutes. The lids should be everted, indeed doubly everted. This can easily be done with a Desmarres retractor or a Walker's lid everter (Beard's Ophthalmic Surgery, p. 373). All particles must be removed before one can say it is thoroughly done.

The use of tear gas is increasing, consequently we must be prepared to care for such cases. Dr. Wm. D. McNally recommends, after considerable experience, first—large quantities of tap water, followed by 0.4% sod. sulphite, in glycerine 75% and water 25%. This should be used immediately and frequently in the eyes, and if severe burns have occurred the fornices must be probed to keep adhesions from forming between the lids and eyeball. On the face 4% sod. sulphite in 50% alcohol is more efficacious.

For refrigerating gas (SO_2) burns, sod. bicarb. 0.4% in glycerine 75% and water 25% is found efficacious. It also should be preceded by thorough irrigation with quantities of water.

In the city, corneal ulcers seldom require the attention of the general practitioner. The handling of such cases is not always easy for the specialist, and inasmuch as so many specialists are available, it is never necessary for a general practitioner to assume the responsibility of such a case.

The doctor who is called to give first aid is in a psychological position to inquire the cause of the injury and suggest prophylactic measures against repetition. Many protective devices in industry today are the result of careful study of accidents by inquiring and thoughtful physicians.

EYE COMPLICATIONS OF THE ACUTE EXANTHEMATA IN CHILDREN

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The ocular complications of the exanthematous diseases may in a general way be considered in two groups. In the first group may be placed the various types of inflammation of the lids, conjunctiva and cornea caused by the specific skin eruption involving these structures. In general, complications of this type are common, they occur early in the course of the disease and their presence is quite obvious. In the second group we find inflammations of the intraocular structures, of the orbit and of the optic nerve. These conditions are less common, they occur later in the course of the disease, they are more serious and the diagnosis may be much more difficult. As a rule, the complications in this second group result from secondary bacteremia of pyogenic organisms and not from the virus of the specific exanthematous disease.

In the past, smallpox was responsible for many cases of blindness. In some instances the pustules appear on the cornea and lead to perforation or at best to very dense opacities. In other cases the marked lid swelling, the profuse purulent conjunctival discharge and the lowered resistance of the patient results in corneal ulceration. Fortunately, these cases are now extremely rare. Mention should perhaps be made of vaccinia of the eyelids which is acquired by unwittingly transferring smallpox vaccine or the material from a vaccination bleb to the eyelids by the fingers. Erysipelas less frequently produces corneal ulceration. In measles there is less lid swelling so that corneal ulcer is rare even though there is a profuse discharge from the conjunctiva. Quite frequently, however, phlyctenular keratitis follows measles, and abscess of the lids due to infection of the meibomian glands is frequently seen during convalescence.

Intraocular inflammations are fortunately quite rare, but when they do occur they are severe and destructive. Panophthalmitis occurs more frequently from scarlet fever and measles than from the other diseases. The lids become markedly red and swollen, the eyeball is proptosed and fixed, the vitreous and later the anterior chamber becomes filled with pus, the cornea turns yellow and there is considerable fever. The eyeball will rupture and pus will be discharged unless surgical relief is given. A milder type of inflammation may also occur, metastatic endophthalmitis, such as is sometimes seen in epidemic meningitis. This condition has somewhat the same appearance as panophthalmitis but it does not go on to perforation of the eyeball; after several weeks the acute symptoms subside and the eyeball gradually becomes soft and shrunken.

Acute inflammation of the structures of the orbit is one of the most important and serious complications of scarlet fever. It occurs less frequently after measles and perhaps it is well to add that it is most often caused by acute ethmoiditis resulting from a common cold. In scarlet fever there are two ways in which this type of inflammation may occur, by bacteria being carried by the blood to the periosteum of the orbit, and by severe rhinitis causing infection of the nasal sinuses, usually the ethmoid or antrum, and this infection in turn extending to the orbit. The metastatic type is the more serious of the two because there is no possibility of spontaneous healing by having the pus drain back into the nose, and a child who develops metastatic infection in the orbit may have a similar condition occur in other parts of the body, particularly in the joints, lungs and pleura. When the orbital inflammation is caused by extension of sinus disease it may or may not go on to true abscess formation. Swelling of the lids due to venous obstruction in the ethmoid region may be the only symptom and may subside after a few days. In more severe cases the infection may break through the orbital wall of the ethmoid capsule and form a sub-periosteal abscess. This causes the eyeball to be proptosed and to some extent limits its motility. When the process has gone as far as this it is still possible for it to heal spontaneously by having the pus discharge back into the nose. Quite often, however, the pus dissects its way forward and appears under the skin at the inner angle of the eyelids. Then this abscess either ruptures spontaneously or is opened surgically. While this dissecting process is going on there is possibility of its spreading backward to the meninges or to the cavernous sinus, there is some possibility of its getting through the

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periosteum into the soft parts of the orbit, and there is considerable hazard to the cornea due to the marked exophthalmos. The greatest danger of all, however, is septicemia, pneumonia and empyema. This is specially true in patients under two years of age and in cases where surgical intervention is done too early before the abscess has had time to become walled off. Treatment of this condition consists in the use of ephedrin or adrenalin in the nose, mild nasal suction, and hot fomentations and perhaps some antiseptic ointment to the eyes. Many cases recover with this treatment alone. If an abscess forms and shows signs of pointing near the inner canthus it should be opened. Intranasal sinus operations, extensive external sinus operations and blind exploratory incisions into the soft parts of the orbit should be avoided, especially early in the course of the disease.

Optic neuritis is sometimes seen in a case of orbital cellulitis where the infection has broken through the periosteum into the retro-bulbar space. It also occurs rarely as an isolated ocular complication and, of course, is often one of the findings when meningitis or encephalitis follows one of the exanthematous diseases.

THE DIAGNOSIS OF IRITIS

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In considering the diagnosis of iritis, may I remind you briefly of the changes which occur in this condition. Usually not only the iris but the ciliary body is involved in an inflammatory process and we call the condition iridocyclitis. There is congestion of both organs but it is impossible to see the vessels of the ciliary body and sometimes difficult to see those of the iris. What we do see is a congestion of the deep ciliary vessels as they pass over the sclera. This differs in no way from the congestion of acute glaucoma. It differs from that of acute conjunctivitis in that it is most marked near the cornea and less so away from it. The difference between deep and superficial congestion is a rather academic one, since both deep and superficial vessels are often involved in iritis. Fortunately we have the other signs of inflammation.

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There is swelling of the iris. We see this as a blurring of the normal iris markings, giving its surface a muddy appearance. This is only recognized by comparison with the other eye under the best possible light.

There is exudation. The normally clear aqueous becomes cloudy and filled with leucocytes. This we see directly if a sharply focussed beam of light is thrown on the eye, when the space between cornea and iris, normally optically empty, is seen to be opalescent. The cells often collect in clumps on the back of the cornea and these may be seen directly in good focal light. In an early or mild case, however, this opalescence is too slight to be detected without special instruments.

There is pain. This is usually marked in an acute case but less marked or absent entirely in many chronic cases. The pain is described in different ways by different patients and there is nothing of constant diagnostic value in their descriptions. The chief difference between this pain and that of acute glaucoma is that in iritis it rarely provokes nausea and vomiting. In acute conjunctivitis there is rarely real pain, only at times the vague sensation of a foreign body. The pain of acute iritis is in large part due to spasm of the ciliary muscle and is hence relieved greatly by atropine.

There is reduction in vision. This is due in part to ciliary spasm which causes a temporary myopia but also to cloudiness of the aqueous or to the deposit of a fibrinous membrane on the lens capsule. Hence it is not marked in the early case and in the mild case vision may be practically normal. In the chronic case vision is often normal till the pupil becomes occluded by a membrane. In acute glaucoma the reduction in vision is much greater, while in acute conjunctivitis there is no reduction in vision.

The pupil is small. This is the most valuable and constant difference between the signs of acute iritis and acute glaucoma and the one most easily observed. The pupil may react slightly to light but does not dilate in the dark as does the normal pupil. In acute glaucoma the pupil is always dilated, and does not contract in the light. This sign alone should usually distinguish between the two conditions.

The intraocular tension is usually low in iritis and always high in glaucoma. This may be difficult to determine by palpation, however, since

the tenderness of the eye prevents the use of deep enough pressure to determine it. A tonometer will always determine it, however, and the ophthalmologist should always use it to obtain the exact tension in a doubtful case. In later cases of iritis the tension may rise, presumably when cells or exudate have blocked the outlets for the aqueous. But the diagnosis of iritis should have been made by other signs long before this occurs.

The pupil is not only small, but early becomes bound down to the lens capsule by adhesions known as posterior synechiae. On account of these and spasm of the sphincter pupillae, the pupil is resistant to atropine and homatropine. Where rise of tension has been excluded, it is often useful to watch the effect of a drop of 2% homatropine. Following this there is only partial dilatation of the pupil, parts of the border usually remaining adherent to the lens until more vigorous treatment with mydriatics has been employed. In acute conjunctivitis there is, of course, no interference with dilatation of the pupil after homatropine.

The error of mistaking acute iritis in its early stages for acute conjunctivitis is at least as common in my experience as the one more often warned against of confusing acute iritis and acute glaucoma. While the latter is serious, it is usually corrected by a call for the specialist's advice. When the general practitioner makes a diagnosis of acute conjunctivitis, however, he is very apt to treat the case himself and may well do so, provided his diagnosis is correct. If the case is really one of iritis, however, the case may easily pass the early stage in which treatment is effective and be finally diagnosed when irreparable changes have taken place. Nearly everyone has a wholesome fear of glaucoma, but it is not so generally recognized that the sequelae of iritis may be every bit as unfortunate. The pupil rapidly becomes so bound to the lens that dilatation is forever impossible, a membrane fills the pupillary space, and in a severe case membranes form behind the lens which later cause retinal detachment and blindness.

The slide shows the principal points of differentiation between acute iritis and the two conditions with which it is most commonly confused, acute glaucoma and acute conjunctivitis. It should always be possible to distinguish between these conditions without special instruments. When thinking of glaucoma, the size of the pupil is most important, but the much greater loss of vision in glaucoma will nearly always be a second plain indication. The tension is of absolute diagnostic significance, but, as previously stated, tenderness and tenseness of the lids may prevent reliable findings by palpation. In considering acute conjunctivitis, it will usually be sufficient if we remember again that true pain is almost never present in conjunctivitis and the vision is not affected. Almost equally important is the presence of mucoid or purulent secretion in conjunctivitis while in acute iritis there is only increased lacrymation.

Chronic iritis is much more difficult to diagnose without special instruments, especially the quiet cases which show no congestion. Sometimes the pupil may be seen to be distorted or traces of a membrane are in the pupil. These signs may be impossible to see, however, without dilatation of the pupil. The use of a drop of 2% homatropine is usually sufficient to allow of a diagnosis by revealing posterior synechiae. It cannot be said that this is without danger, however, unless accurate means of recording tension are at hand. Most practitioners will prefer to advise special examination in those cases showing loss of vision for which they cannot find a cause.

When we have made a diagnosis of iritis, we are, of course, only at the beginning of our task since we must make, if possible, an etiologic diagnosis. This problem, however, I leave in the capable hands of Dr. Brawley.

ETIOLOGY OF IRITIS

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The chief causative factors may be classified as follows:

1. Focal infections.
2. Systemic disease as syphilis, gonorrhea and tuberculosis.
3. Allergy.
4. Traumatism due to operative procedures and to injuries, perforating or otherwise.

Experimental work shows iritis can be produced by actual lodgement of microorganisms in the eye. In most instances, however, there is no demonstrable evidence of bacteremia. Formerly these cases were ascribed to a rheumatic con-

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dition but now evidence has accumulated showing that many of them are due to foci of infection in remote parts of the body. The most common foci are found in the teeth, tonsils, nasal sinuses, prostate gland and deep urethra, the colon, urinary tract, uterus, and gall-bladder. While not finally determined the present impression is that the iritis is brought about either by direct lodgement of organisms in the eye; by systemic intoxication from toxic products from bacteria, either produced by them or released by autolysis of dead organisms, or by an allergy.

The first hypothesis, that of a bacteremia, is very rare. The second factor, that of toxemia, acts by elective localization and is probably the most frequent cause of iritis, ueveitis, etc.

Rosenow's work, confirmed by many others, demonstrated that intraocular infections could be produced in animals from an infective focus by intravenous injection of the infecting streptococcus. These were cases where iritis was present and had been proven to be due to the organism used in the experimental work. From 67 to 75% of the animals inoculated developed the endocular infection, iritis, etc. The cases of focal infection, where no ocular complications existed, showed only 7% of endocular infection when their infecting organisms were injected intravenously into animals. These results have been questioned by other investigators, who, unable to confirm the tests, deny the whole theory of elective localization.

As to allergic sensitization there is considerable evidence accumulating to show that this phenomenon is a factor in the production of intraocular inflammatory reactions, especially in recurrent cases. An allergic response may occur from bacteria, their toxic products, or from other foreign proteins even in such minute amounts that they produce no systemic symptoms.

By first immunizing animals by subcutaneous, intravenous, or intraperitoneal injections of a foreign protein, an iritis has been produced by injecting the same substance after an interval. This has been repeatedly demonstrated in tubercular infections not due to the bacilli themselves but to their disintegration products which escape into the blood stream of an allergic patient and produce repeated attacks of iritis, the original tubercular focus being symptomless.

Gifford, in 1931, analyzed 118 cases of iritis; 22% were of tonsillar origin, 16.9% due to syphilis, 12.7% to infected teeth, 8.5% to combined infections, 6.8% to sinus infections and 6.8% to gonorrhea, 1.7% were diabetic and in 16.1% no cause could be found.

Iritis due to syphilis may occur in the acute secondary stage and may be difficult to differentiate from ordinary iritis. However, systemic manifestations will usually be found if searched for carefully. In certain improperly treated cases of syphilis a Herxheimer reaction may involve the iris. Late cases of syphilis may show iritis which may possibly be due to another cause while it is not uncommon to find negative serological tests in this stage, obscuring the diagnosis. Even efficient treatment of the syphilis, if not continued long enough, results in involvement of the iris and uveal tract as these structures, together with the central nervous system, are very slow in developing immunity. This is shown also by the fact that cases with iritis show a higher percentage of neuro-syphilis than those without it.

In gonorrhea, iritis usually occurs with the arthritis. Late iritis in gonorrhea may also occur due to a prolonged infection with the development of allergy.

Prostatic infections, aside from the gonorrheal type, are usually secondary to other infected foci as in the teeth and tonsils and may cause relapses after the original focus has been removed.

THE TREATMENT OF IRITIS

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In the treatment of endogenous iritis it is of the utmost importance to consider the underlying etiology. When this is known, treatment is employed to eradicate whatever the source of infection may be. However, there are many cases in which the etiologic factor cannot be found, and the treatment must be empirical.

The empirical treatment consists of the use of mydriatics, foreign proteins, systemic treatment, heat, tuberculin, etc.

Mydriatics are used in all cases of acute and in most cases of chronic iritis or uveitis. Atropine sulphate, U. S. P., is the mydriatic most used, the strength varying from one to five % in solution. Actual crystals may also be used. More fre-

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quent instillations of the weaker solutions are preferable to those of greater strength. The instillations should be made in such a way that the cornea comes into intimate contact with the solution, as it is best absorbed through the cornea. The drops may be instilled into the upper part of the eyeball or the patient may be in a prone position. If the dilatation is sluggish, or posterior synechia are present, subconjunctival injections of cocaine hydrochloride, U. S. P., epinephrine hydrochloride, U. S. P., and atropine sulphate may be made after first anesthetizing the eyeball with Butyn 2%, Pantocaine ½%, or Holocaine 1%. Aseptic precautions must be observed. A good formula to use is the following:

Rx
Cocaine hydrochloride, 4% ..... mij
Epinephrine hydrochloride, 1-1000 ..... mij
Atropine sulphate, 1% ..... mij
Normal Saline Solution ..... mx

The above subconjunctival injections may be made daily for three to six days. The site of injection is sterilized with an applicator soaked in half strength tincture of iodine.

For patients sensitive to atropine sulphate, or who develop an atropine conjunctivitis from use of same, one may substitute scopolamine hydrobromide, U. S. P., (from 0.2 to 1%), hyoscine hydrobromide, U. S. P., (from 0.1 to 1%), or duboisine sulphate (from 0.25 to 1%). Scopolamine hydrobromide seems to give the best results.

Epinephrine packs consisting of a small fold of cotton saturated with three to four minims of epinephrine solution 1: 1,000, and placed in the previously anesthetized culdesac for two and one-half minutes, is also useful as a mydriatic agent when atropine sulphate fails. It is a much safer procedure than the subconjunctival injection method mentioned previously. Levoglaucosan may also be used to break posterior synechia when other milder procedures fail. The packs may be used one to two times daily for a period up to six days.

Some authorities advocate the use of Dionin (ethyl morphine hydrochloride solution, 1-10%), or in powder form in conjunction with the mydriatics.

For many years the use of milk injected intramuscularly has been of great value. Ten cc. of non-pasteurized milk, boiled for three minutes, is injected intramuscularly, usually in the gluteal region, every 48 hours for three to four doses. This results in a rise in temperature to 101-103° or more, accompanied by a chill, lasting half an hour or more. The injections are not repeated until the temperature has been normal for a twenty-four hour period. The injections occasion considerable local pain and may even result in abscess formation.

For this reason we have abandoned the use of milk and now use typhoid vaccine injected intravenously in increasing doses. The dose here depends upon the type and strength of typhoid vaccine used. We usually start with 15,000,000 bacilli injected intravenously, increase the dose 10,000,000 after the temperature has been normal for twenty-four hours, and follow with the third and subsequent injections on alternate days, increasing the dose at each injection according to the previous reaction. Milk derivates such as protein milk may also be used. Mild cases of iritis may be treated with intramuscular injections of Omnadin 2 cc. on alternate days. No fever reaction or chill usually results here.

The general condition of the patient must be carefully considered before a foreign protein is administered, the contra-indications being fever, low vitality, heart disease, etc.

The systemic treatment should include the use of mild mercurous chloride at night followed by saline purges in the morning. Sodium or acetyl salicylate is widely used, and in amounts from 30 to 100 grains daily. Gifford advocates the use of one grain per pound of body weight daily, depending on the tolerance. Mercury rubs and iodines may be of value. Calcium gluconate, 10 cc. of a 10% solution, given intravenously daily or every other day may be of benefit.

Of utmost importance is the use of heat in some form to increase the hyperemia. Formerly this was accomplished by the use of hot moist applications. Lately we have been using the more hygienic and easily applicable electrothermophore, diathermy and most recently short wave diathermy, which we have found to be very efficacious. Infra-red or therapeutic heat lamps may also be used at two to four hour intervals.

Tuberculin therapy is used in those cases where a suspicion of a tuberculous etiology may be present. There is some danger of the diagnostic test, especially if the posterior segment is involved. In treatment the usual initial dose is

very small, usually 0.00001 mg. of old tuberculin; it is repeated once a week in gradually increasing dosages over a period of several months.

In the treatment of chronic uveitis where no definite etiology is present, one may use intravenous injections of sodium gold thiosulphate, 0.025 gms., twice weekly. From twenty to twenty-five injections may be given in one course and may be repeated two to three months later.

58 E. Washington St.

DIVERTICULA OF THE FEMALE URETHRA

Report of Two Additional Cases

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Urethral diverticula have been reported in the literature since their description in 1814 by Sir Charles Mansfield Clarke. Most reports are confined to diverticula of the male urethra. Recently I reported six cases of diverticula of the female urethra. Since then two more cases have been seen, which I desire to report here. I am indebted to the members of the Urological department of St. Lukes Hospital for this privilege of reporting these cases.

CASE REPORTS

Case 1. E. K., a young white female of 30 years, entered St. Lukes Hospital, No. 305238, on the service of Dr. L. E. Schmidt. She had been complaining of burning on urination at intervals for six years, which lately had become constant. One year ago backache appeared and was severe. Pelvic examination by Dr. H. O. Jones was completely negative. She had never had venereal disease. Cystoscopy revealed a normal bladder. Urethroscopy revealed the opening of a diverticulum. This was injected from the meatus with 15% Sodium Iodide in KY Jelly, using a blunt tipped bulb type syringe. (Fig. 1.) The diverticulum was dissected out vaginally and removed. Recovery was uneventful.

Case 2. H. W., a colored female of 37 years was admitted to St. Lukes Hospital, No. 313768, on the regular service. She had noticed a vaginal mass for seven years and had also had burning and slightly increased frequency of urination during this time. She had undergone a supravaginal hysterectomy in 1927, at which time the mass was present but not large and was diagnosed as sub-urethral abscess. She denied venereal disease. In the anterior vaginal wall a mass the size of a large walnut was palpable and was slightly sensitive. Urethroscopy revealed several apparent defects, one of which allowed an ureteral catheter to pass for several centimeters. 8% Sodium Iodide was injected and an x-ray made. (Fig. 2.) The mass was dissected down to a rather wide pedicle and excised. Recovery was uneventful.

Classification of Urethral Diverticula. The usual classification which is followed by every one reporting instances of diverticula of the urethra is that of Watts.

Urethral Diverticula. A. Congential.

B. Acquired.

1. From dilatation of the urethra
   a. Due to urethral calculus
   b. Due to urethral stricture

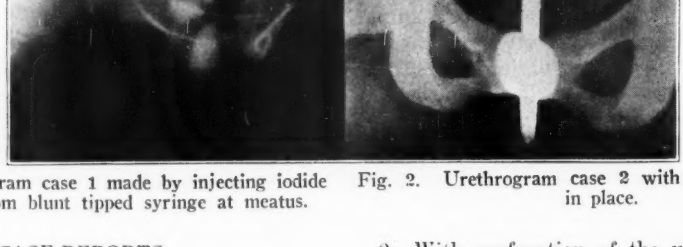

Fig. 1. Urethrogram case 1 made by injecting iodide in KY jelly from blunt tipped syringe at meatus.

Fig. 2. Urethrogram case 2 with cystourethroscope in place.

2. With perforation of the urethra resulting from
   a. Injuries to the urethra
   b. Rupture of absesses into the urethra
   c. Rupture of cysts into the urethra

Histology of the Female Urethra. The length of the female urethra is about 25 to 30 mm.

The mucous membrane forms longitudinal folds. It is lined with stratified squamous epithelium. In many cases, however, pseudostratified columnar epithelium can be found; numerous smaller and larger invaginations (lacunae) are formed by the epithelium. The outpocketings in their wall are lined in many places with clear mucous cells, as in the glands of Littré in the male urethra. The glands may accumulate colloid material in their cavities or may even contain concretions.

The lamina propria, devoid of papillae, is an irregularly arranged connective tissue with abundant elastic networks. It is provided with a slightly developed system of venous plexuses and has therefore a cavernous character.

The mucous membrane with its veins is surrounded by a thick mass of smooth muscles.

Embryology of the Urethra. Embryologically, the vesico-urethral anlage enlarges and transforms into the bladder and into either the entire female urethra or the prostatic and membranous male urethra.

Embryos of ten weeks are at the beginning of the definitive stage. In the male, the edges of the urethral groove progressively fold together and thus transforms open urogenital sinus into the tubular urethra. The scrotal swellings shift caudad to their final position where each becomes half of the scrotum, separated from its mate by the raphe and underlying septum scroti. In the meantime, the shaft of the penis elongates, and by the fourteenth week, the urethra has closed as far as the glans. The urethra is then continued along an epithelial plate which represents a solid part of the original urethral anlage incompletely partitioning the glans; by splitting, the plate is first converted into a trough which promptly recloses into a tube that continues the urethra to the definite opening at the tip of the glans.

Changes in the female are less profound, yet slower. The phallus lags in development and becomes the clitoris with its homologous glans clitoridis and prepucium. The shorter urethral groove never extends onto the glans as in the male. It remains open as the vestibule. The urethral folds which flank the original groove constitute the labia minora.

Suter explains the embryological defect leading to the formation of congenital diverticula in this way: The urethra takes its origin from the genital furrow which, covered with epidermal epithelium, forces its way into the position which it is to occupy later as the urethral canal. This canal, at first partially open, has at this time a communicating bridge of epithelium with the external surface. The epithelium of the canal becomes cylindric; that of the communicating epithelial bridge remains squamous. Normally the walls of the canal coalesce and become the urethra, and the epithelial bridge is absorbed. It is the persistence of this communicating epithelial bridge that Suter believes is the cause of diverticulum formation or of dermoid.

Kaufman states that "in the male any diverticulum not in the pendulous urethra near or in the fossa navicularis cannot be of congenital origin." In the female, however, the absence of this highly differentiating area in the development of the urinary organs explains the failure of the development of congenital diverticula in them.

Etiology. Diverticula connecting with the female urethra have an acquired origin, usually from trauma from childbirth especially in difficult or instrumental labor, and from abscess cavities which have drained into the urethra and have frequently failed to become obliterated.

An interesting illustrative case is under observation at the present time in the out-patient department of the hospital. Several months ago a young colored female was first seen complaining of severe frequency and burning on urination and a low backache. She had had gonorrhea and had two instrumental deliveries. Examination revealed thickening of both Bartholin glands, one of which eventually abscessed. The urethra was markedly thickened and boggy. A slight urethral discharge showed no gonococci. While under observation the symptoms subsided but a cystic mass about the size of a pecan remained. Mercurochrome injected into it appeared at the meatus. She is now waiting for a hospital bed for complete examination and care.

Routh thought their etiology might by 1.

closure of the ducts of pre-existing urethral glands; 2. blood cysts; 3. formation of pseudo-cysts by injury to the urethral floor during labor or instrumentation.

Tait thought they originated in an error of development, namely an offshoot resulting from a faulty union of the primal folds.

In making a decision histologically between a congenitally formed diverticulum and an acquired one, we should, in the absence of secondary inflammatory changes, find the wall of the congenital urethral diverticulum containing those strata characteristic of mucous membrane, namely epithelium, basement membrane and tunica propria.

In one of the previously reported cases the histology shows a sac wall which has all the requirements of one congenitally formed (Fig. 3). However, the history reveals the occurrence

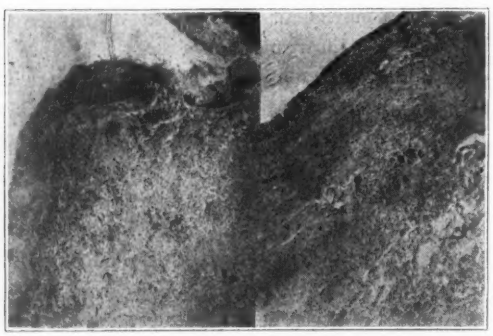

Fig. 3. Photomicrograph of sac wall showing complete epithelial lining.

Fig. 4. Photomicrograph showing sac wall with edge of epithelium.

of an acute inflammation of the periurethral tissues which was diagnosed a periurethral abscess. Whether this was true or whether the periurethritis occurred around a sac already formed is difficult to decide. Dr. E. F. Hirsch, the pathologist at St. Lukes Hospital, suggested the possibility of the sac developing from traction on the urethra during contraction following the periurethritis, analogous to the development of traction diverticula of the esophagus.

Case 1 gives no history of either trauma or inflammation, and the sac wall was of the inflammatory type, but with a partial epithelial lining varying from columnar to pseudo-stratified. (Fig. 4) Case 2 gives a history of an inflammatory process and the sac wall is typically of the acquired type.

Histologically, it is difficult to interpret the findings. We consider all sacs as being of the acquired type except in the one case previously mentioned. If the sac wall has a complete epithelial lining and its walls have the same layers as are found in the urethra, it may have been formed congenitally. However, most walls are made up of scar tissues and show inflammatory changes and if a partial epithelial lining is found, it is usually near the neck of the sac and is assumed to have grown in from the urethral epithelium.

Symptomatology. The presenting symptoms of women with urethral diverticula are predominantly lower urinary in character. Burning on urination is common and is usually associated with an increased day frequency and occasionally nocturia. Occasionally there is bladder heaviness or suprapubic discomfort and a mild bearing-down sensation on urination. If the diverticulum becomes moderately large the patient may herself notice the swelling. Commonly some associated pathology produces symptoms such as the vaginal discharge from an endocervicitis and the low abdominal pain and low backache from adnexal disease. In no case was there hematuria and in all the urine had become infected.

Diagnosis. The diagnosis is relatively simple if the condition is kept in mind during an examination to determine the cause of lower urinary tract complaints. If the patient has already noticed the swelling, it is simple to orient it anatomically. In the urinary tract study, the bladder and higher urinary tract must not claim the entire attention, as many urethral lesions will be overlooked. Urethroscopy will reveal the diverticular opening. An ureteral catheter can be inserted and the diverticulum easily defined on the urogram by injecting with any of the usual radiopaque media. Urethrograms can also be made by injecting 15% sodium iodide in KY jelly from a blunt tipped bulb type syringe placed at the meatus.

Treatment. The treatment is entirely surgical. To attempt to aid healing by the injection of irritant chemicals is merely a waste of time and may prove dangerous. It is a simple matter to dissect out the sac under general anesthesia. After the vaginal preparation a

weighed retractor is inserted. To bring the anterior vaginal wall and the diverticulum into clear view, Young's bi-lobed prostatic retractor is inserted. The mucous membrane and fascia are divided either longitudinally or transversely over the mass. By means of sharp and blunt dissection the diverticulum is dissected out down to its orifice. This is transfixed and ligated and the soft tissues brought over the stump in several layers. The fascia and mucous membrane are approximated, removing any excess mucosa. To aid healing, the bladder is drained by an inlying small Pezzer catheter for from five to seven days. The bladder receives daily injections or irrigations to control infection. The postoperative course is uneventful, the patient leaving the hospital by the tenth postoperative day. Each of the eight cases have healed primarily.

CONCLUSIONS

1. Urethral diverticula in the female are not uncommon.

2. They are acquired either from inflammatory processes or trauma.

3. The marked difference in the embryology of the urethra explains the rarity of congenital origin.

4. A new factor in their production, that is, traction, is suggested.

5. The diagnosis is simple if the possibility of its occurrence is kept in mind.

6. Urethroscopy and urethrography clinch the diagnosis.

7. Excision of the sac is the only rational therapy.

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NARCOSUSTAINED THERAPY IN PSYCHOSIS WITH HEART LESIONS

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At the outset, it may seem a bit curious for one known to dwell regularly in the realm of mental deviations to have his presentation captioned, "heart lesions." That curiousness readily will dissipate once you focus your attention on trailing down more explicitly the subject matter in hand.

In the domain of psychiatric service few indeed are those encountered with disturbances of the cardiac mechanism. The problem entertained basically was an attack upon the distorted mental elaborations independent of any other systemic implication with the recently described therapeutic component — Narcosustained therapy.[1] In the effort thus made, a few observations accidentally encountered in instances associated with cardiac involvements proved sufficiently provocative to justify calling thereto the cardiologist's attention.

Of the material under consideration the following briefly may be said: generally speaking, there is no definite relationship between the psychotic picture and the nature of the cardiac disturbances, including even such pathology which may have occasioned atrophies of the brain. However, in failure of compensation the person has transient confusional states with hallucinations, especially of sight and sometimes of touch. He becomes emotionally restless with predominating elements of fear, less frequently of pleasure. Noteworthy is the variable daily state of consciousness; some tend to become delirious only during the night. Breathing is increased, the sleep is disturbed; the afflicted will shout and groan. In mitral stenosis one is apt to encounter evidence of impairment of memory while in precordial distress, marked anxiety states seem to be more or less constant. Some patients may present a picture resembling the manic with wavering attention, talkativeness, ecstatic mood, combination of ideas of persecution and grandeur. Finally, there are some among the frankly manic-depressive types (incorrectly designated as symptomatic

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psychosis) in whom a disturbance of the heart function may be consequential instead.

Case 1. A retired male physician, barely past middle life, while in the course of treatment in a general hospital for congestive heart failure, was admitted to the Institute because of supervening, acutely-toxic mental symptoms. In bed he was unable to lie down, assuming the sitting posture all the time. Edema was quite extensive, the abdomen filling very rapidly after several tappings. Dyspnea was marked. The pulse was uneven and the veins of the skin stood out prominently. There was liver enlargement. He sometimes would become confused, swerving from being noisy and delusional to manifesting restlessness and distress. Sleep was scarcely possible. He was a pathetic sight. I readily concurred with the physicians previously in attendance that the man had no future. Narcosustained therapy was resorted to out of sheer humanitarian motives. He was kept in a state of light sleep for about six days.

Of particular interest was the absence of evidence of refilling of the abdomen after the paracentesis instituted during sleep. The edema of the legs likewise began to subside gradually. Due largely to my own state of keyed-up enthusiasm, the treatment was terminated on the sixth day instead of carrying it through the full ten day period. He left the Institute two weeks later, apparently free from any disturbing physical symptoms; mentally he had cleared up entirely.

Case 2. A woman, 45 years of age, married twice, was admitted with marked pressure of activity and flight of ideas. She was untidy, very noisy and destructive. She had a chronic heart condition and it was stated that, as a result of it, she had on one occasion remained in a state of coma for forty-eight hours. History of a luetic infection from the first husband was elicited. Physically, she appeared emaciated with an "earthly-brass-like" hue and visible veins of the skin. She had swollen ankles and there was a heart murmur. The physician in attendance, Dr. L. B. Dunkle, who treated her for chronic myocarditis, considered the outcome rather gravely. She was given the sleep treatment which had to be discontinued on the fifth day because of an extremely low physical state. She was allowed to come to, and when her general physical condition had improved, again was put to sleep for a period of ten days.

Mentally, after the treatment, she remained fairly normal for a while. She was taken home much improved but while there, again became excited. A course of fever treatments was instituted for the luetic condition. Physically, the heart condition showed an improvement approximating a cure. She had put on considerable weight and there were no ankle swellings. She was seen in a State institution a year later, her physical condition was even better; mentally, she was not well although somewhat improved.

Case 3. A newly-wed female, 24 years of age, began hearing voices telling her that she had to die. She wanted her sister to "go" with her. To make this possible, she had tried to choke her sister on several occasions. Then she became very apprehensive over the impending disaster, appeared suspicious and frightened; she refused food and became untidy. Physically, she was thin with an "earthly-brass-like" hue and with scattered petechea tending to assume a brownish appearance. There was a heart murmur that was not always heard; its character too, was subject to changes. A diagnosis of schizophrenia with endocarditis was made. She was given the sleep treatment and kept in a state of light narcosis for nine days. The average daily dose of dial used in this case was a little over ten grains. One dose of digalen was given on the second day of sleep. The murmur subsided early in the course of treatment and was not heard again a month later. Mentally, she awoke apparently free from any symptoms, but had a relapse one week later.

Case 4. A married man, 51 years of age, economically very comfortably situated, was admitted to the Billings Memorial Hospital, because of shortness of breath and palpitation for about three years and edema of the feet and ankles for four weeks. Later, he was referred to us for morphine addiction which had developed because of severe dyspnea. On examination, the left border of the heart was found to extend to the anterior axillary line. There was a presystolic gallop rhythm, a slight systolic murmur and occasional extrasystoles. The urine and renal functions were normal. He was subjected to a state of narcosis for a period of five days for the residual drug tendencies. Under Dr. Leiter's regimen, previously instituted, the heart condition showed much improvement.

These cases are included to bear out my contention that certain heart conditions are no contraindication to sleep therapy with dial. For the heart conditions which were not available here for application, care is to be exercised in applying sleep therapy before its value and margin of safety are ascertained. Similarly, cases with severe forms of arteriosclerosis may require guarded consideration. There is a gradual reduction in the systolic blood pressure averaging about 30 mm of mercury during the first few days, returning to normal afterwards and not infrequently reaching above normal towards the end of the treatment. According to Wicki,[2] the quantity of dial necessary to stop the heart's action is seven times greater than the amount necessary to arrest respiration. Dargein and Dore,[3] reporting a case of poisoning, pointed out that diallylbarbituric acid may have a direct effect on the nervous mechanism of the heart. Jackson and Lurie[4] maintain that the effect of the derivatives of barbituric acid on the heart is temporary and not an untoward reaction.

The material just reviewed, while numerically rather meager to justify very convincing asser-

tions has, nevertheless, a measure of qualitative merit to compensate for this limitation. To those familiar with prolonged sleep therapy in psychiatry, there is today no known measure in mental therapeutics equally meritorious. From reports of different investigators including observations of my own, from 60 to 80% of selected cases conservatively estimated, have been rendered symptom free, where every other measure previously tried, had failed. Yet, there is still a remainder that resists even this form of approach. Needless to say, that by resorting to sustained sleep one is incapable of concretely solving all the problems awaiting solution which, possibly, have for years coaxed the individual into a dramatic state of oblivion. Yet an open avenue of approach is made possible by this method psycho-therapeutically further to strip the individual of his bearing-down wraps. Else how often if ever, does one successfully penetrate through the rigid realm of the combative and inaccessible; through the negativism of a stuporous catatonic; through the extreme flight of ideas of an irritable hyperactive manic, etc.?

Isolated instances of cures through the induction of a state of stupor in the field of mental therapy have been known for centuries. Klasi,[5] however, is credited with having systematized in 1920, the method of inducing the prolonged sleep now employed in modern psychiatry. A number of investigators have followed in rapid succession, equipped with newer chemical components. The barbiturates were found more serviceable. Prominently represented are dial, somnifen, and sodium amytal; luminal also has been tried.[6] In this country, dial has been used by the essayist since 1929. Blackwenn,[7] in 1930, reported using sodium amytal. Some of the progress with the derivatives of barbituric acid is to be credited to obstetricians who have sought to alleviate pain at childbirth.

From experiments carried on with different agents used in sleep, it is apparent that hypnotics of the barbiturate group have a direct effect upon the thalamus and are therefore considered as thalamic hypnotics while ether, chloroform, alcohol, chloral hydrate, paraldehyde and bromides are classified as cortical narcotics or hypnotics.[8]. Kesser and Kesser[9] demonstrated the presence of barbiturates in the mid-brain and thalamus, suggesting that these regions are of particular significance in sleep. For instance, caffeine as a cortical stimulant, easily awakened animals in which sleep was induced with chloral hydrate. In the decerebrated animals caffeine proved to be inactive. In the same condition, that is, when sleep has been induced in decerebrated animals with chloral hydrate, drugs such as epinephrin or ephedrin considered to be subcortical stimulants, have pronounced waking effect. The combined cortical and thalamic hypnotics have synergic effects on animals.

These observations should prove of value to the clinician dealing with severe forms of insomnia, in pronounced cases of psychoneurosis and during the acute stages of the mentally disturbed.

For the purpose of comparisons, I have here and there investigated the barbituric acid derivatives more commonly in use. The actions of the available barbiturates are subject to certain variations. Some of them are short-acting, while others may be classified as long-acting; there are also those whose actions are more or less intermediary. A striking example of the short-acting group is nembutal. Sodium amytal is an example of the intermediary-acting drug. Given per mouth dial acts rather slowly and in isolated instances beginning sleep may be relatively protracted in the first twenty-four hours especially in drug addiction and alcoholics where larger doses usually are required. However, once a deep sleep is effected, most of them continue on smaller doses. Moreover, the narcotic effect of dial is considerably more lasting and it is because of the last stated property that I have found dial the most serviceable in prolonged sleep therapy. The effect of luminal on the thalamic area is rather negligible. Patients cannot be deeply narcotized with this drug unless amounts larger than therapeutic doses are administered. Somnifen is not well borne by the heart, and has a greater tendency to the production of a state of collapse or bronchopneumonia than do other barbital derivatives. Juliusburger[10] in 1914, stated that along with other barbiturates, diallylbarbituric acid appears to have an affinity for the thalamic area of the brain. Individual tolerances must, of course, be considered. (See Chart 1.)

Technique. Physicians contemplating the ap-

plication of this form of therapy would do well to read the description in detail in the *Journal of Mental and Nervous Diseases* for March, 1934. Briefly, the procedure begins on the night before by having the patient prepared as for a major operation. In the morning the

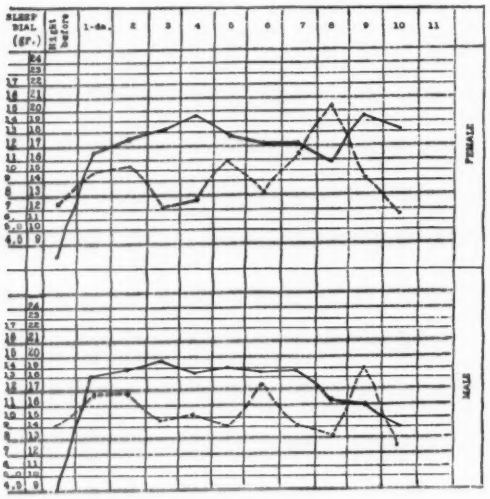

Chart 1. Showing average number of hours of sleep and Dial used every 24 hours in 16 cases.
———— Daily Sleeping Hours.
- - - - - - No. of Grains of Dial in 24 Hours.

lower bowel is cleansed with enemas. Fluid in the form of unsweetened tea and sodium bicarbonate, four drams in water, constitute the total intake per mouth for the day. At the approach of evening one capsule containing 4½ grains of dial is given orally and repeated in four hours until initial signs of dimming consciousness appear. I have often added two or three capsules of nembutal to the initial doses of dial. The action of nembutal is almost spontaneous but of short duration. Under simultaneously administered doses, by the time the patient ordinarily awakens from nembutal, he continues to sleep from the dial. When the patient is combative, resistive and negative, the initial dose of the drug is given rectally instead of orally. *At no time should the dose be repeated when the patient is drowsy and swallowing is difficult.* As soon as there is any indication of a cloudy state of mind, proctoclysis is at once begun and about 2400 cc. of physiological salt solution in six divided portions is given in twenty-four hours by the drop method. To three of these feedings, five per cent. of grape sugar is added, and one such sugar solution is given alternately with one of straight, physiological salt. A total of 60 grams of dextrose is the average amount used in twenty-four hours.

The patient is kept in a state of narcosis for a period of ten days. Cases of drug addiction do well in four to six days. The drug now is administered rectally, for which purpose I use an acqueous solution specially prepared by the manufacturer, 1 cc. of which is equivalent to a grain and a half of dial. From 3 to 4 cc. usually is introduced through an aperture in the Murphy drip tube so that it will enter the rectum along with the feeding solution, drop by drop.

The types of sleep recorded are, sound, light, drowsy or wakeful. The depth of sleep has no material bearing on the clinical outcome. A convenient way of measuring depth is to make a comparative test of the patellar reflexes with those of the biceps. In a lightly narcotized patient, the knee jerks are sluggish while the biceps are brisk. In deep narcosis, the knee jerks are lost while the biceps remain sluggish.

The nurses are provided with work charts which call for recording evidences of shock, coughing spells, body rashes, rhinorrheas, too rapid pulse, rapid breathing and urinary retention. The patient is turned from side to side about every two hours, occasionally on the abdomen, rarely on the back. He is allowed to arouse an hour or two every day in order that he may move and turn about for much needed exercise. When medication is stopped, consciousness gradually is regained. The patient recognizes people about him, but the memory retention remains poor. Such a state of amnesia is quite general and pronounced and lasts about 72 hours. Speech is difficult, only single words are enunciated and these with difficulty. Often these are repeated over and over again. The whole picture bears a close resemblance to sleep in lethargic encephalitis. The patient takes note of everything around him and hesitates. Frequently, delusional trends follow partial awakening in this stage, often reflecting situational conflicts quite vividly. In many, a mild toxic state with predominating visual hallucinations and confabulations frequently is discernible.

The most important complications to guard against are bronchopneumonia, collapse and

drug idiosyncracies. Of lesser importance are dehydration, urinary retention, trauma and gaseous abdominal distentions. Incidents of pneumonia are lessened by adhering strictly to the details of the preparatory stage, by avoiding too deep narcosis extending over long hours, by changing positions of the body, by allowing daily rousing periods and lastly, by checking vomiting tendencies.

Too sudden and too deep narcosis may predispose the patient to collapse. In the event of collapse or coma, the use of coramine in doses of 5 to 15 cc. administered intravenously hourly or oftener if necessary, until the patient arouses, is advised. Drug idiosyncracies become apparent generally on the day the drug is given, manifested by a scarletinous rash and accompanied by profuse nasal and pharyngeal mucous secretions. Along with the rash there comes a rise in temperature usually not evidenced so early in the treatment. Such experiences suggest the advisability of administering one dose of the drug before the preparatory stage is fully under way.

Kidney conditions, acute or chronic, are contraindications of this treatment. The incidents of complications, if any, were manifestly fewer where an intelligent, specially trained nurse was in charge. The task of a nurse assigned to a narcotic patient is trying, but most nurses seemingly profess a juvenile enthusiasm, notwithstanding the ordeal. In short, the success will depend upon the technical exactness employed in carrying out the treatment. Each patient requires the most meticulous nursing care and medical supervision.

To explain the *mechanism* underlying the clinical achievements from sustained narcosis involves a task academically still venturous. The Bleuler school sees in the physical measures of the preparatory stage, carried out in a distinctly hopeful and confidence-inspiring atmosphere, a *psychic* influence.[11] The patient is given assurance that some important changes will take place after the treatment; that the treatment is the means whereby the most serious symptoms can be cured. Mueller[12] believes that the various hypnotics exert specific influence over various types of the psychosis. "Dial," he states, "has a specific effect upon the manics." A coagulating drug, like sodium amytal, administered to a person whose cell colloids are in an over-dispersed state, will result, in the opinion of Bancroft,[13-14] in a re-establishment of cellular equilibrium with consequent recovery. Sodium rhodondate, on the other hand, administered to a person whose cells are conversely, in an over-agglomerated state, will produce similar effects. Lovenhard[15] and his co-workers elaborated upon the basis of cortical stimulation and cellular *oxidation*. In my former paper, elucidated on the *physiological* conception, wherein the benefits derived are due to implied rest, the patient is reverted to what appears to be a pre-natal equivalent. The goal of the embryo is strikingly developmental; hence of necessity, rest is continuous. By rest, *mental rest is implied*. Mere physical rest, especially in surroundings free from distracting influences, is usually conducive to greater mental insult. Owing to accrued data gathered before and after that expressed view, pointing to an altered *metabolic* state during sleep, the following postulate should be added to the gestures already stressed. In most cases treated, a state of ketosis is fairly constant. (See Chart 2.)

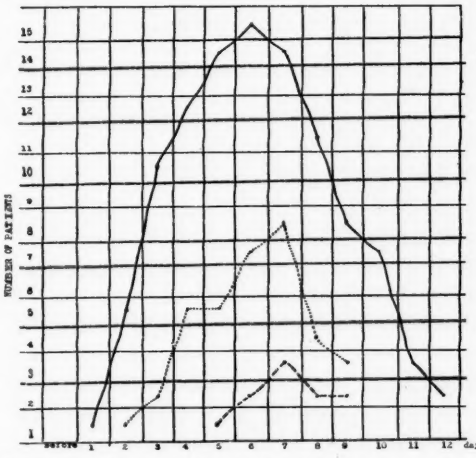

Chart 2. Showing Acetone, Diacetic Acid and Albumin during narcosustained therapy.
——— Acetone.
- - - - - - Diacetic Acid.
..... Albumin.

In starvatiton, such products are there because of *incomplete combustion* of fat. The prevailing opinion [16] is that as long as there is available in the diet one gram of carbohydrate for every four grams of fat, the latter will be completely oxidized to carbon dioxide and water. Should that ratio of four to one under-

go a change, so that let us say, one gram of carbohydrate is ingested with every five grams of fat, the latter is incompletely oxidized, and a state of ketosis will result. The ketones act like hypnotics. Narcosis is apparent when the blood shows 0.32 to 0.83% acetone. The dietary regimen prescribed for epileptics is calculated to effect a state of ketosis sufficiently potent to suppress epileptiform seizures without having to resort to the usual narcotics. (Narcotics usually suppress epileptiform seizures for a considerable period.) Peterman,[17] however, states that epileptic patients who are placed on the ketogenic diet and rendered free from attacks did not have a return of convulsions when alkalosis was produced, and that the ketosis per se was not responsible for the relief obtained. This view is corroborated further by Gamble[18] when he states that with the appearance of acidosis in children, due to the rapid elimination of the fixed base, dehydration results. The benefits therefore derived are because of a state of dehydration. It is reasonable to assume that a state of dehydration will make possible freer oxygen contact with the cellular structure of the brain, favoring thereby better oxygenation, which in turn may lessen the irritability of the cells.

Where the tabulation of recoveries (which tentatively speaking may be only remissions) elsewhere in this paper is alluded to, reference is made only to selected cases. These in part embrace the benign types, such as the manic-depressives and the catatonics of the more or less malignant variety. In both of these, the psychotic manifestations tend to recur, in some instances with almost uniform precision. In this particular, they are somewhat analogous to the essential epilepsies. In epilepsy there is an escape periodically from willed and productive performances, associated with a total obliteration of the psychic functions. On the other hand, in the former, there are corresponding psychic episodal projections, with the muscular system generally not participating. On the basis of this periodicity, where in the one consciousness and the motorium are involved, and in the other solely the psychic sphere, the undercurrent cannot be widely dissimilar.

Summary. In a series of over 100 cases in neuropsychiatric service treated with sustained narcosis, a few were encountered with heart lesions. The latter proved to be no contraindication to this form of therapy. On the contrary, sustained narcosis was seen to be distinctly beneficial in nearly all instances of cardiac pathology encountered. I, therefore, recommend this form of therapy for use in cardiological service in cases where every other measure previously tried has failed.

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DISCUSSION

Dr. Morris Lev, Michael Reese Hospital: Dr. Magnus' interesting paper brings out something new for consideration in the treatment of heart disease. In heart disease we strive to give a maximum amount of rest. The treatment of heart disease can be roughly divided into two parts. First, medication directed towards the improvement of the cardiac condition itself in order to bring up the efficiency of the heart, and secondly, a reducction of the bodily demand upon the heart that already has been damaged. For tonight, we

are concerned only with the latter phase. I have had no experience with the prolongation of sleep therapy brought out by Dr. Magnus. It seems to me that this method might be applicable in two types of heart disease: first, in a definite heart muscle failure, and second, in acute coronary occlusion. In the former, I would reserve this treatment for those cases which have failed to respond to the usual type of treatment. The average case of failure I do not believe needs such a procedure as Dr. Magnus has outlined. All of us have had ambulatory cases of cardiac failure which respond fairly well to simple treatment. Neither does this method need to be employed in the usual type of cardiac arhythmia, and certainly not in cardiac murmurs. Digitalis is not a cure or a method of treatment for cardiac murmurs. If in these patients with definite cardiac failure, our usual methods of treatment fail to bring about improvement, then Dr. Magnus' methods might be resorted to. It is feasible that a period of prolonged sleep and prolonged narcosis might give the heart a chance to recuperate, so that when the patient awakens, he is found improved.

I do not believe that prolonged narcosis should be substituted for our recognized methods of treatment in heart muscle failure. A more recent method of treating this is by the removal of the thyroid. This offers a more permanent means of relieving the demands upon a damaged heart by reducing the bodily metabolism.

In acute coronary occlusion I believe we all feel that rest is the essential factor. We try to give maximum rest, mentally and physically. This prolonged narcosis might be helpful in the type of case where morphine in sufficient doses does not relieve the pain or quiet the individual. Here again, the duration of the narcosis and its depth would have to be worked out from actual clinical experience and observation. This method is not one to be used by everybody or to be used indiscriminately. There are very definite dangers and contraindications.

Dr. John T. Nerancy, Elgin State Hospital: Dr. Magnus was kind enough to come to Elgin a year and a half ago to assist us with a number of cases in which we were instituting the dial treatment. All of these patients were treated according to this method. Institutional treatment of course, is somewhat different from private practice. We do not give the patients any luminal to put them to sleep. We do give luminal for epilepsy.

As Dr. Magnus mentioned, the depth of sleep was not of real importance. As I remember it, most of our cases indicated a very deep sleep.

The results of the treatment were practically the same as he outlined. We had a group of four patients under treatment at one time. We had one nurse, one attendant and a couple of intelligent patients helping with this group. In all, thirteen patients were treated and most of them responded favorably.

I was interested to find that not all workers believe that acidosis is the main factor in producing the beneficial results. The latest trend I understand is the introduction of insulin and glucose to prevent acidosis. Those who have worked with this claim the results are just as good if not better. During this treatment there is a rise in the leucocyte count and there is a shift to the left of hydrogen ion factor.

There are a number of things which point to an organic influence in this treatment. I am not sure whether the psychogenic feature is the really outstanding factor.

We have had a number of cases in which we used what we call a modified sleep treatment. The patient at no time is completely under the influence of the drug, because we give small doses over a prolonged period. Twice, we have had occasion to use coramine and have found it distinctly helpful.

Dr. Frederick C. Test: As I see it, it is Dr. Magnus' contention that the administration of prolonged narcosis by temporarily obliterating the mental processes, is accompanied by some changes in the cytoplasm which apparently produces an actual, definite and positive symptomatic effect. How long does this improvement last and how often is there a recurrence of the condition for which the patient was narcotized—or is there a definite, lasting improvement?

Dr. J. F. Biehn: I should like to call Dr. Magnus' attention to some work recently done by Professor Poulton at Yale, in which he has shown that luminal absolutely abolishes the motor cortex.

I also believe that abdominal distention is due to a direct action of the barbiturate on the musculature because it affects not only the stomach and ileum but also the colon. The distension is due to a definite paralysis, as shown by Barlow at Western Reserve University.

Barbiturates are not anesthetics; they are hypnotics and sedatives. There is a marked difference between the barbiturates. We know that barbital and luminal are excreted by the kidneys and recovered 90% of the time. The others are found in the liver.

Dr. Alexander B. Magnus (closing): When a remission or cure is reported, it is taken for granted that the patient was discharged free from any mental symptoms. It is too early to say how long that patient is going to stay well. I have kept in touch with some patients for the last three or four years and there have been no recurrences. Perhaps ten or twenty years hence, we may be in better position to refer to the treatment as a cure.

DELIVERY OF THE SHOULDERS IN VERTEX PRESENTATION

Mechanism and a Modified Method of Delivery

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Difficulty in the delivery of the shoulders is sufficiently encountered in vertex presentations to merit an investigation of the mechanism of the passage of the shoulders through the pelvic cavity, and the cause of the dystocia. Dystocia

in the delivery of the shoulders is due to an arrest of the shoulders at the pelvic inlet in the majority of instances and is due to a disturbance of the physiology of the uterus. The result is the addition of a new diameter and fossa of the pelvic inlet, a new concept regarding the mechanism of the shoulders entering and passing through the pelvic cavity, and a modified method in the management of the delivery of the shoulders based on the mechanical and physiological principles of the first and second stage of labor.

In addition to the accepted diameter of the obstetric pelvis, the author proposes another diameter which will have a bearing on the delivery of the shoulders. This diameter extends from the sacroiliac synchondrosis at the brim of the pelvis to the middle of the superior border of the symphysis pubis which is designated as the "pubo-sacro-iliac diameter." It is a physiologic diameter in which the mechanism of labor arrests the shoulders (bisacromial diameter) in the "pubo-sacro-iliac diameter" which coincides to bony landmarks. In a number of dried pelves it measures approximately 11 cm. (Figure 1.)

When the dried pelvis is dealt with obstetrically only the true pelvis is generally considered. Little attention is paid to the false pelvis. On each side of the promontory of the sacrum is found a depression or fossa made-up of the alae of the sacrum and the posterolateral portion of the iliac fossa. Between the two is found the sacroiliac synchondrosis. As we look upon this region from above, in the articulated pelvis, it appears to be continuous with the iliac fossa, except that the alae of the sacrum are slightly elevated. This region will be designated as the "ilio-alar fossa." (Figure 1.)

MECHANISM OF THE SHOULDERS IN OCCIPITO LAEVA ANTERIOR POSITION

At the onset of labor the fetal head is in or in relation to the pelvic cavity with the sagittal suture in the right oblique diameter and the occiput about 35 degrees from the symphysis pubis. The shoulders (bisacromial diameter) lie in the "pubo-sacro-iliac diameter," so that the anterior shoulder is in relation to the superior border of the symphysis pubis, and the posterior shoulder is in relation to the left sacroiliac synchondrosis and the "ilio-alar fossa" above the brim of the pelvis.

After the delivery of the fetal head the shoulders are found to be above or in the pelvic cavity in either the "left pubo-sacro-iliac" or the left oblique diameter. The mechanism of the expulsion of the fetal body is dependent upon the physiologic response of the uterus, particularly the property of retraction of the upper uterine segment. When the shoulders are delayed in the movements of descent and internal rotation, after the fetal head is delivered, it signifies that the delay is due to a temporary disturbance of the physiology of the uterus in which condition the bisacromial diameter is found in either the "pubo-sacro-iliac" or the oblique diameter. When the uterus readjusts itself to normal function by further retraction of the upper uterine segment to bring about tautness of the longitudinal muscle fibres and obliteration of the transverse contracted zones, it brings about the movements of descent and internal rotation for the mechanism of the expulsion of the fetal body.

The above consideration of the mechanism of

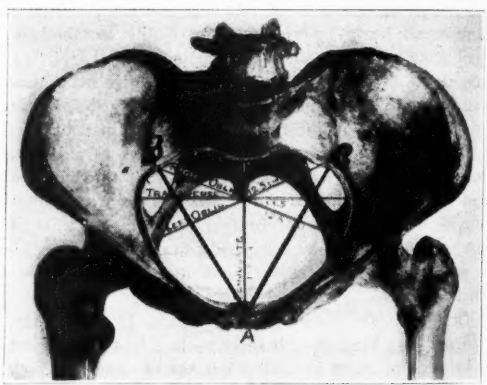

Figure I. AB is the Right Pubo-sacro-iliac diameter. AC is the Left Pubo-sacro-iliac diameter. B and C are the right and left Ilio-alar fossa.

the expulsion of the fetal body demonstrates that after the fetal head is delivered the shoulders follow two mechanism: First, the shoulders are arrested in the "pubo-sacro-iliac diameter" until the uterine musculature readjusts itself for the physiologic movements of descent and internal rotation. Second, with the delivery of the fetal head the uterus is rapidly adjusted to the fetal body by retraction of the upper segment which brings about the sequential physiologic movements of descent and internal rotation of the shoulders. The anterior shoulder, in the majority of instances, is found under the symphysis pubis which designates that synchronously, or

very soon after the delivery of the fetal head the shoulders have been rotated from the "left pubo-sacro-iliac diameter" into the left oblique diameter; and by further descent and internal anterior rotation the shoulders are re-rotated into the antero-posterior diameter of the pelvic cavity for the normal mechanism of the delivery of the shoulders.

Occipito Dextra Posterior Position. After the fetal head is in or in relation to the pelvic cavity with the occiput posterior and the sagittal suture is in the right oblique diameter with the occiput 135 degrees from the symphysis pubis, the shoulders (bisacromial diameter) are either in the left oblique diameter with the fetal back inclined to the right or in the transverse diameter with the fetal back directly posterior.

During the first stage of labor the fetus undergoes the following mechanisms:

First, the fetal head and body maintains its respective relation and is rotated as a whole within the uterus to an anterior position. Second, the fetal head and body maintains its respective relation until the presenting part meets the pelvic floor through the vagina; the position is the same as it was at the onset of labor. Third, the fetal head is rotated to a transverse or to an anterior position, but the shoulders or the fetal body are rotated slightly anteriorly.

During the second stage of labor, and after the fetal head has been delivered the shoulders are in relation to the pelvic cavity as follows: First, the shoulders have rotated to the right "pubo-sacro-iliac" or to the right oblique diameter. Second, the shoulders have not rotated and are found to be in the left oblique diameter with the fetal head inclined to the right, or in the transverse diameter with the back posteriorly. I am leaving out of consideration those cases in which the fetal head has rotated posteriorly or occipito-sacral position in which case the shoulders will enter the pelvic cavity either in the transverse diameter or the oblique diameter for expulsion.

A study of the normal mechanism of the shoulders demonstrates that the position of the shoulders in occiput anterior positions, before the onset of labor, is that the bisacromial diameter is in the "pubo-sacro-iliac diameter." The shoulders should enter the pelvic cavity in an oblique diameter. Thus the shoulders in O.L.A. and L.O.P. after the movements of descent and internal rotation, should enter the pelvic cavity in the left oblique diameter; and R.O.A. and R.O.P. in the right oblique diameter. At the onset of labor the anterior shoulder is in relation to the superior border of the symphysis pubis, while the posterior shoulder is in relation to the brim of the pelvis at the corresponding sacroiliac synchondrosis, or the shoulders lie in the "pubo-sacro-iliac diameter" in occiput anterior positions. During the first stage of labor the shoulders usually remain in its respective "pubo-sacro-iliac diameter," until the second stage when the movement of descent and internal anterior rotation occurs with the fetal head rotating into the oblique diameter and then into the anteroposterior diameter for the mechanism of expulsion. The occiput posterior positions after rotating into an occiput anterior position undergoes the same mechanism as an occiput anterior position.

When the fetal head is in the uterine cavity or in the vaginal canal the point of direction of the presenting part in normal occiput anterior or posterior positions is the occiput, so that the longitudinal force is transmitted to the occiput through the fetal spinal column which is due to the coordinated action of the uterus[1] and the fetal postural mechanism.[2] With the fetal head delivered there must be a new presenting part and a point of direction for the mechanism of delivery of the fetal body. The anterior or the posterior shoulder becomes the presenting part with the acromium process as the point of direction to which the longitudinal force is applied. By this mechanism the bisacromial diameter is shortened because one of the shoulders descend first through the pelvic cavity which causes the shoulders to pass through the pelvic cavity in an oblique manner until it begins to pass through the pelvic outlet. Were the shoulders to descend through the pelvic cavity parallel to the planes of the pelvic cavity it would meet with a greater resistance from the bony pelvis and the soft tissues of the pelvic cavity. The posterior shoulder normally becomes the pivot for the oblique descent of the shoulders until the anterior shoulder is rotated and descends to and under the symphysis pubis when the pivot for the descent and rotation of the posterior shoulder is changed to the anterior shoulder.

The Mechanism of the Shoulders in Occiput anterior position. With the onset of the second

stage of labor the anterior shoulder (the shoulders or the bisacromial diameter are in the "pubo-sacro-iliac diameter") is found in the region of the superior border of the symphysis pubis. After the delivery of the fetal head the anterior shoulder may be arrested for some minutes at the symphysis pubis until the uterine musculature is readjusted by retraction of the upper uterine segment to the fetal body. When the uterine musculature has readjusted itself the rotatory mechanism of the uterus causes the anterior shoulder to be rotated into the oblique diameter, and is then rerotated into the anteroposterior and descends to the pubic arch.

The posterior shoulder remains in the region of the "ilio-alar fossa" and acts as the pivot for the descent and rotation of the anterior shoulder. The promontory of the sacrum prevents the posterior shoulder from rotating into the posterior portion of the anteroposterior diameter of the pelvic inlet. When the anterior shoulder has descended and rotated into the anterior portion of the anteroposterior diameter under the symphysis and in the pelvic outlet, the posterior shoulder descends and is rotated into the posterior portion of the anteroposterior diameter in the wide pelvic plane for the mechanism of delivery.

The principles underlying the dystocia of the shoulders in vertex presentations consist of two factors, a defect in the movements of descent and internal anterior rotation of the shoulders, and the mechanism resulting thereof. In vertex presentations the shoulders are arrested in the "pubo-sacro-iliac diameter" at or above the pelvic inlet. This is the normal position of the shoulders in many instances after the head is delivered in the second stage of labor. Therefore, in order to bring the anterior shoulder down into the pelvic cavity after the head is delivered, it is necessary to change the shoulders (bisacromial diameter) from the "pubo-sacro-iliac diameter" into one of the oblique diameters. If we attempt to deliver the anterior shoulder from the "pubo-sacro-iliac diameter" into the anteroposterior diameter by the usual method the anterior shoulder is impinged against the upper portion of the symphysis pubis which on forcible traction on the fetal head may result in serious trauma to the child by stretching of the brachial plexus, the cervical vertebrae, or to the soft tissues of the fetal neck.

Sever,[3] and Clark, Taylor and Prout[4] have demonstrated that traction and forcible separation of the head and shoulder puts the upper cords, fifth and sixth cervical cords and the suprascapular nerve of the brachial plexus under dangerous tension. This tension may be so great that the upper cords stand out like violin strings. The degree of traction and forcible attempt in bringing the presenting shoulder down and under the symphysis pubis will depend whether the upper cords are only stretched or it may also involve the lower cords (seventh and eighth cervical cords and the first thoracic nerve). Bullard[5] writes that the brachial plexus is stretched when the presenting shoulder is caught behind the symphysis pubis, and reports 43 cases of injury, of which 40 cases were in vertex and 3 cases in breech presentations. Bailey[6] states that haste in the delivery of the shoulders is an important factor in brachial plexus paralysis. Fairbanks[7] is in favor of the traction theory, and reports 40 cases of brachial plexus paralysis of which 32 cases were in vertex and 8 cases in breech presentations. Schumacher[8] reports 93 cases of brachial plexus paralysis of which 50 cases were in vertex and 43 cases in breech presentations.

The location of the injury to the brachial plexus will depend upon whether traction is made for the anterior or posterior shoulder in the delivery of the shoulders after the fetal head is delivered.

I have incorporated Sever's analysis of 471 collected cases of brachial plexus paralysis in order to emphasize its frequency in vertex presentations. (Table 1.) It is generally considered that brachial plexus is mainly traumatized in breech presentations. Sever has tabulated 219 cases following vertex presentations, and 186 cases in which the presentation was not recorded. So whatever number we take from the 186 undiagnosed presentations will demonstrate that more than 50% of brachial plexus paralysis will complicate vertex presentation. Fairbank's and Bullard's experience show that the brachial plexus paralysis predominate in vertex presentations. The forceps and the direct pressure on the brachial plexus does not appear to play an important role in brachial plexus paralysis, but traction and forcible separation of the head and shoulders after the delivery of the fetal head is due to a delay in the movement of the rotation

of the shoulders from the "pubo-sacro-iliac diameter," into its respective oblique diameter, constriction ring dystocia, large fetus, pelvic neoplasms, faulty mechanism of delivery and undue haste in attempting to deliver the shoulders as the most important etiological factors concerned in the brachial plexus paralysis.

The normal relation of the fetal cervico-spinal vertebrae, during the stage of fetal expulsion, is such that each vertebra rests above and below on other vertebrae through the intervertebral discs which architecture brings about a definite protection to the vertebrae in longitudinal presentations. This is a physiological requirement for birth in that it prevents trauma to the structures of, and those related to the fetal cerebrospinal column. This physiologic requirement is normally brought about in the normal mechanism of labor by the physiology of the uterus in bringing about the normal sequence of the movements of the mechanism of labor, thereby, causing the fetal cervico-spinal vertebrae to be in close apposition to each other while the fetus is passing through the uterovaginal canal. The postural state of the fetus is due to the fetal postural mechanism which causes the fetus to maintain a state of flexion of the head and body during a uterine contraction. In the normal expulsion of the fetus the spinal column, muscles, nerves, and blood-vessels are at no time under tension in either a cephalic or podalic delivery.

This mechanism of the physiology of the cerebrospinal column is well demonstrated by the experiments of Sever with dead fetuses to show the manner in which excessive traction on the fetal head will cause a disturbance of the normal protective mechanism of the structures related to the fetal cerebrospinal column. Excessive traction on the fetal head may cause separation of vertebrae which may lead to dislocations and fractures of the vertebræ, stretching or tearing of the spinal nerves, particularly the brachial plexus, and laceration and tearing of muscles which may be associated with hemorrhage into the muscles, intervertebral discs, and the spinal column by rhexis in either cephalic or podalic presentations.

When the shoulders (bisacromial diameter) are above the pelvic inlet and in the "pubo-sacro-iliac diameter" the posterior shoulder is in relation to the "ilio-alar fossa." Traction on the child's head to bring the anterior shoulder down and under the symphysis pubis will displace the posterior shoulder laterally into the "ilio-alar fossa." If the shoulders are in the "pubo-sacro-iliac diameter" and the posterior shoulder below the brim of the pelvis at the sacroiliac synchondrosis, traction on the fetal head will fix the posterior shoulder against the posterolateral wall of the pelvic cavity, so that a great deal of force will be necessary to bring the anterior shoulder directly down and under the symphysis pubis for the delivery of the anterior shoulder. When the posterior shoulder is below the brim of the pelvis in either the oblique or "pubo-sacro-iliac" diameter an attempt to bring the anterior shoulder down and under the symphysis pubis will lead to an impaction of the shoulder, because the shoulders will have to pass through the pelvic cavity parallel to the planes of the pelvic cavity instead of passing through the pelvic cavity in an oblique manner. This is for one of the shoulders to act as a pivot for the other shoulder in an oblique direction after the shoulders have rotated into its oblique diameter. Therefore, the mechanism to initiate for the delivery of the shoulders is first to bring the anterior shoulder down from the anterior portion of the "pubosacro-iliac diameter" into the oblique diameter which will place the shoulders (bisacromial diameter) in its respective oblique diameter, and will place the bisacromial diameter obliquely in the pelvic cavity, so with the least resistance from the bony pelvis and the soft tissues of the pelvic cavity they will undergo the normal movements of descent and internal anterior rotation by a "spiral movement" to under the symphysis pubis and into the anteroposterior diameter of the pelvic outlet for its passage through the pelvic cavity which is the normal mechanism of the delivery of the shoulders.

Management of the Delivery of the Shoulders. After the fetal head is delivered, we should wait for some minutes to allow the uterine musculature to readjust itself by further retraction. In many instances the retraction of the uterus keeps pace with the movements of descent and internal anterior rotation of the fetal head, so that the anterior shoulder is found to be under the symphysis pubis and in the pelvic outlet immediately after the delivery of the fetal head. In other instances the fetal head is delivered and after waiting for some minutes, we find that

external restitution has not taken place or the anterior or the posterior shoulder has not descended into the anteroposterior diameter of the pelvic outlet after the head is delivered, but is arrested in the "pubo-sacro-iliac diameter." It is in this situation that we must initiate by *art* the normal mechanism of the shoulders in order to prevent undue trauma to the fetal neck from faulty delivery of the shoulders. The retraction of the uterus brings the fetal body in relation to the uterus whereby the uterus is able to bring into play the physiologic function of the uterus in bringing about the normal movements of descent and internal rotation of the fetus.[2]

The first requirement after the delivery of the fetal head and waiting for some minutes is the diagnosis of the diameter that the shoulders are in. The management will depend upon whether the shoulders are in an oblique or in the "pubo-sacro-iliac diameter." The diagnosis is made by a vaginal examination with two fingers of one hand, index and middle, in palpation of the anterior shoulder in the region of the posterior aspect of the pubic arch or higher on the posterior wall of the symphysis pubis, or in the right or left anterior portion of the pelvic cavity. When the shoulders are in the oblique diameter the fetal head is grasped by the hands at the chin and occiput with the sagittal suture in the transverse diameter. Slight traction is made slightly downward and may, also, be aided by slightly twisting the fetal head (chin) upward in order to initiate the normal rotation of the anterior shoulder from its oblique diameter into the anteroposterior diameter whereby the anterior shoulder will descend down and under the symphysis pubis in a "spiral movement." The shoulders are now at the pelvic outlet, and if too great resistance is met with, it is safer to pass an index finger into the anterior or posterior axilla and deliver a shoulder by pressure rather than by excessive lateral traction of the fetal neck. If the shoulders are in the anteroposterior diameter at the pelvic outlet the above maneuver without twisting of the fetal head is sufficient.

When the shoulders are in the "pubo-sacro-iliac diameter" or the anterior shoulder is at the superior border of the symphysis pubis, it is necessary to rotate the anterior shoulder into its respective oblique diameter before traction is begun for the delivery of the shoulders. After waiting for some minutes the following methods are in order.

First, a trial traction is made as described which in many instances will succeed in bringing the shoulders into the pelvic outlet. If too great resistance is met with the second method is necessary.

Second, the child's head is grasped as described above. Slight lateral traction of the fetal head is made slightly downward and medialward by slightly twisting the fetal head anteriorly by directing the occiput anteriorly towards the anterior portion of the oblique diameter, so that the anterior shoulder will rotate into its respective oblique diameter, viz., in O.L.A. the occiput is slightly twisted upwards and to the left. At the same time that traction is applied to the fetal head pressure is made by the hand of an assistant over the hypogastric region which is over the anterior shoulder toward the right or left in order to direct the shoulder into its respective anterior portion of the oblique diameter. If this maneuver is accompanied with too great resistance force should not be used, but rather suspect that the shoulders are impacted.

When the shoulders are impacted, it implies that the posterior shoulder is below the brim of the pelvis at the sacro-iliac synchrondrosis and the bisacromial diameter is parallel to the planes of the pelvic cavity. This type of shoulder dystocia is not entirely due to a large child, but in many cases to an impaction. If an attempt is made to forcibly bring the anterior shoulder through the pelvic cavity it may cause death of the child, or permanent or temporary injuries to the brachial plexus, cervical vertebræ, or to the soft tissues of the fetal neck. Therefore, in impacted shoulders it is necessary to displace one of the shoulders upward and out of the pelvic inlet, rotate the shoulders into its oblique diameter as described above which will permit the shoulders to pass through the pelvic cavity obliquely instead of being parallel to the planes of the pelvic cavity in its descent through the pelvic cavity.

I am convinced that a great deal of trauma is done to the brachial plexus, the cervical vertebræ and to the soft tissues of the fetal neck by the excessive traction in attempting to bring the anterior shoulder down and under the symphysis pubis from its position in the "pubo-sacro-iliac diameter" for the mechanism of delivery. This

probably is the explanation for those cases of brachial plexus, dislocations and fractures of the cervical vertebræ and trauma to the soft tissues of the neck in which it appears that the mechanism of the delivery of the shoulders were normal.

Summary. The normal mechanism of the shoulders is the arrest of the shoulders (bisacromial diameter) in the "pubo-sacro-iliac diameter." After the delivery of the fetal head one of the acromium processes becomes the point of direction for the movements of descent and internal anterior rotation of the body of the fetus which brings the shoulders into its respective oblique diameter, and by a "spiral movement" is brought down and under the symphysis pubis into the anteroposterior diameter of the wide and outlet planes of the pelvis at which time by our *art* we should deliver the shoulders. The movements of descent and internal anterior rotation is purely due to the physiology of the uterus, the fetal postural mechanism, and the soft tissues of the pelvic cavity and the bony pelvis playing a secondary role in the mechanism involved. The bony pelvis and the soft tissues of the pelvic cavity are the primary factors in dystocia in the delivery of the shoulders.

The forcible traction of the fetal head in bringing the anterior shoulder directly down from the superior border of the symphysis pubis into the anteroposterior diameter of the wide and outlet planes of the pelvic cavity is an unnatural or faulty mechanism in the delivery of the shoulders and is potentially dangerous on account of the probable injury to the brachial plexus, cervical vertebræ and the soft tissues of the fetal neck. The maneuvers described are physiologic or natural, and the mechanism that we should attempt to follow. Once the fetal head is delivered haste is unnecessary in extracting the child.

CONCLUSIONS:

1. A new diameter is presented, the "pubo-sacral-iliac diameter" which is the diameter the shoulders are normally arrested in anterior cephalic presentations.

2. The posterolateral portion of the iliac fossa at the sacroiliac synchondrosis is obstetrically designated as the "ilio-alar fossa" which allows the posterior shoulders to pass onto when necessary.

3. Dystocia in the delivery of the shoulders in vertex presentations is due to a disturbance of the physiology of the uterus which delays the normal mechanism of the movements of descent and internal anterior rotation of the shoulders with the result that the shoulders are not rotated into its respective oblique diameter, but are arrested in the "pubo-sacro-iliac diameter."

4. The shoulders descend and rotate from the "pubo-sacro-iliac diameter" into an oblique diameter, and by a "spiral movement" descends and rotates under the symphysis pubis into the anteroposterior diameter of the pelvic outlet. The shoulders should pass through the upper half of the pelvic cavity in an oblique manner.

5. The attempt to bring the anterior shoulder from the superior border of the symphysis pubis directly down and under the symphysis pubis is not a normal mechanism and predisposes the fetal neck to severe trauma. The shoulders should be properly maneuvered into its respective oblique diameter, before an attempt is made to bring the shoulders through the pelvic outlet.

55 East Washington Street.

TABLE I. CONDITIONS EXISTING AT THE TIME OF BIRTH (Sever)

Boys	235
Girls	236
Total	471
Right arm affected	272
Left arm affected	186
Both arms affected, upper arm type	2
Both arms affected, lower or whole type	1
Both arms affected, type not noted	6
Upper arm type	400
Lower or whole arm type	64
Difficult labor	418
Ether used	363
Forceps used	317
Normal labor	32
Asphyxiation of child	102
Head presentation (including face)	219
Breech presentation (including foot and version)	66
Position not known	186
Fractured clavicle	14
Arm broken	3
Cord around the neck and arm	2
Cord around the neck	2
Pupils unequal	16

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THE FAMILY DOCTOR

Now as formerly the most important Specialist in Medical Practice.

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CHICAGO

"In his researches, he found that the great world was wholly engrossed by a few practitioners who had arrived at the summit of reputation, consequently were no longer obliged to cultivate those arts by which they rose: and that the rest of the business was parcelled out into small enclosures, occupied by different groups of personages male and female, who stood in rings, and tossed the ball from one to another, there being in each department two sets, the individuals of which relieved one another occasionally. Every knot was composed of a waiting woman, nurse, apothecary, surgeon and physician, and sometimes a midwife was admitted into the party; and in this manner the farce was commonly performed.

"A fine lady, fatigued with idleness, complains of the vapors, is deprived of her rest, though not so sick as to have recourse to medicine; her favorite maid, tired with giving attendance in the night, thinks proper, for the benefit of her own repose, to complain of a violent headache, and recommends to her mistress a nurse of approved tenderness and discretion; at whose house (in all likelyhood) the said chamber-maid hath oft given the rendezvous to a male friend. The nurse, well skilled in the mysteries of her occupation, persuades the patient, that her malady far from being slight or chimerical, may proceed to a very dangerous degree of the hysterical affection, unless it be nipped in the bud by some very effectual remedy: then she recounts a surprising cure performed by a certain apothecary, and appeals to the testimony of the waiting woman, who being the gossip of his wife, confirms the evidence and corroborates the proposal. The apothecary being summoned, finds her ladyship in such a delicate situation, that he declines prescribing, and advises her to send for a physician without delay. The nomination of course falls to him, and the doctor being called, declares the necessity for immediate venesection, which is accordingly performed by the surgeon of the association.

"This is one way of beginning the game: though the commencement often varies, and sometimes the apothecary, and sometimes the physician, opens the scene; but be that as it will, they always appear in a string, like the flight of wild geese, and each confederacy maintains a correspondence with a particular undertaker."

It is only the terminology and language that differentiates this from a modern article. It is a quotation from the Adventures of Ferdinand, Count Fathom, written by Dr. Tobias George Smollett, published in 1753.

But specialism did not begin in the 18th century. Osler states:

"Medicine may be said to have begun with specialists. The Ebers papyrus is largely taken up with the consideration of local diseases, and centuries later we find in Greece certain individuals treating special ailments; and Aristophanes satirizes a 'rectum specialist' in a way not unlike our comic journals would 'poke fun' at an oculist or aurist. The tail of our emblematic snake has returned into its mouth; at no age has specialism been so rife. It is unnecessary to remark that the public, in which we live and move, has not been slow to recognize the advantages of a division of labor in the field of medicine. The desire for expert knowledge is, however, now so general that there is grave danger lest the family doctor should become, in some places a relic of the past. It must, indeed, be a comfort to thousands to feel that in the serious emergencies of life expert skill is now freely available."

The public of today has never heard of the specialists of ancient Egypt or Greece. It is not satisfied with a type of medical service comparable to that described by Smollett in the England of the 18th century. They idolize the services rendered by the general practitioner of the 19th century. Why should this be so? What was there in the services rendered by the general practitioner of the last century that is lacking in the services rendered by modern general practitioners or specialists, practicing as individuals or as members or employees of firms or corporations?

The average physician of the 19th century in the United States, attended a district school, and sometimes a secondary school, rarely a college before commencing the study of medicine. In many instances, his entire medical training was obtained by working under a preceptor. Others in addition to a minimum of about sixteen months under a preceptor, attended a course of lectures in a medical school for one or two terms. If they attended for two terms they attended the same lectures twice. The Medical Department of Lind University which became the Chicago Medical College and later Northwestern University Medical School instituted a graded curriculum in 1859, Harvard about 1872, and other schools followed suit during the next twenty-five years. The education received was in no way comparable with that of the modern graduate partly because of the type of instruction but more especially because our knowledge of disease has expanded so rapidly during the last fifty to seventy-five years. How can it be that the more scientific medicine of today that has resulted in such reductions in morbidity and mortality, is not as satisfactory to the public

Read before LaSalle County Medical Society, Streator, Illinois, November 21, 1935.

as the services of the idolized general practitioners who seem to us to have been "jacks of all trades but masters of none."

But were they masters of none? Are they remembered because they were general practitioners or because they were really specialists in an unrecognized and forgotten field?

Oliver Wendell Holmes, poet, essayist and physician, who long opposed the lengthening of the courses of lectures in the medical schools, which my grandfather so ardently advocated, appreciated the situation when in 1867 he said in address to a class in the Harvard University Medical School:

"The idea is entertained by some of our most sincere medical brethren, that to lengthen and multiply our winter lectures will be of necessity to advance the cause of medical education.—As this school could only lengthen its lecture term at the expense of its "Summer Session" in which more direct, personal, and familiar teaching takes the place of academic discourses, and in which more time can be given to hospitals, infirmaries, and practical instruction in various important specialties, whatever might be gained, a good deal would certainly be lost in our case by the exchange.—A medical school is not a scientific school, except just so far as medicine itself is a science. On the natural history side, medicine is a science; on the curative side, chiefly an art. This is implied in Hufeland's aphorism: 'The physician must generalize the disease and individualize the patient.'"

In the meantime, "the winter term" of lectures has been lengthened from three to eight or nine months and the "summer term" has been omitted, the course extended to four years; the preceptorship eliminated. The results of this change are known to all. The modern graduate knows much more of the science of medicine, infinitely less of the art. And all that he knows of medicine, he has learned from specialists in limited fields, from the viewpoint of such specialists. Today the medical schools are turning out, not general practitioners, but general specialists, many of whom believe themselves capable without further training or experience to practice any or all of these specialties; men who are interested in the diagnosis and treatment of disease but who fail to consider the patient. This situation is well delineated in the following quotations:

C. Macfie Campbell stated: "Within the last few decades, there has been a growing recognition that the disease has been overemphasized; that the patient has been somewhat neglected. Physicians with great experience and much human sympathy have been dismayed by the impersonal attitude of scientifically trained physicians who are so dehumanized that they treat their patients with the precision and detachment with which they treat their experimental guinea pigs and mice. Such an attitude may bear the hall-mark of science and therefore be beyond criticism. This attitude toward the problems of medical practice may claim the authority of science only if science is very narrowly interpreted as being confined to the precincts of the laboratory and only if the actual phenomena of human nature be looked upon as outside the sphere of scientific observation. To do justice to his patients, the physician must take into consideration not only the precise laws of the laboratory but also the laws which regulate the reactions of man to his environment even though these laws cannot be formulated in mathematical or precise physical terms."

And George R. Minot wrote: "A considerable fraction of the successful care and treatment of patients and, undoubtedly, the prevention of much illness is to be identified with the proper consideration of sociologic factors. The case of every patient who consults a physician has a medical social aspect. This social component of medicine may vary widely in importance, but frequently it plays a major role in diagnosis, prognosis and treatment and in the prevention of disease and unhappiness. Everyone is constantly confronted with social problems which he settles without great difficulty or to which he soon adjusts himself: but the problems may become of medical significance, so that as Parry of Bath indicated late in the eighteenth century, it is often more important to know what kind of a patient has a disease than what disease the patient has. Lack of thoroughness and imperfect skill are causes of many errors in the prevention, diagnosis, and prognosis of disease and in the treatment of patients. The diagnosis of the patient is often neglected when the diagnosis of the disease is considered in detail."

It seems that one may safely deduce that the difference between the old time general practitioner who rendered service that was satisfactory to the public differed from the modern general specialist whose services appear to be less satisfactory in that he particularized the patient and generalized the disease instead of generalizing the patient and particularizing the disease. As much, if not most, of our therapy is still symptomatic and not specific this difference is of paramount importance. One may conclude that the old time general practitioner is remembered because he was a specialist in family practice. But where do we find family doctors today?

Generally speaking, not in the metropolitan or urban areas, not in the clinics, not on the faculties of our medical schools; but in some rural communities. It is noteworthy that physicians in such communities have less competition from irregulars than do those practicing in larger com-

munities; that, though they do not practice as scientific medicine, do not rely as much on clinical and x-ray laboratories or consultants as do their confreres in the cities, they give greater satisfaction to their patients.

In impersonal clinics, free, part pay and full pay, the patient who has the disease receives little consideration. Yet medical social workers arose as physicians, working in such clinics, appreciated his importance. These social workers are aware of his importance and of the fact that the disease is considered almost exclusively by the teachers of medicine and by those practicing in organized clinics. It almost seems as if they fostered impersonal medicine as exemplified in organized group clinics to insure a growing field for medical social work. But even the most scientific physicians with the aid and cooperation of the most able medical social workers cannot render services as satisfactory to the patient as were those of the old family doctor. Yet the clinic, the organized group of specialists in limited fields of practice, can engage in general practice and render service incomparably superior to that furnished by an individual attempting to cover the whole field of medical practice.

The solution of the problem of medical service seem then to depend upon the revivification and recognition both by the public and by the profession of the specialty of family practice. As Osler said: "The family doctor is the man behind the gun, who does our effective work. That his life is hard and exacting: that he is underpaid and overworked: that he has but little time for study and less for recreation—these are the blows that may give finer temper to his steel, and bring out the nobler elements in his character."

This family doctor of the twentieth century should be well grounded in the fundamental sciences; should be an able diagnostician in all fields of medicine and able to care for the eighty odd per cent. of illness that does not properly require the service of the qualified specialist in a limited field of practice; should know when the services of such specialists are indicated; should thoroughly understand and fully appreciate preventive medicine and its practice. He need not know the technical procedures of surgical therapy except asepsis and first aid but must know what surgical therapy can accomplish and when it is indicated. Similarly he need not know the technique of all laboratory, diagnostic or therapeutic procedures that may be used in diagnosing and treating all of the diseases classed under the medical specialties though he should appreciate their significance and the indications for their use.

If the revivification of the specialty of family practice is the solution of the problem of devising ways and means of furnishing to all of the public the best of medical service all of the time; the medical curriculum must be changed. The undergraduate medical course must be directed to the education of family doctors and not as at present to the education of general specialists. Specialism in a limited field should be restricted to those doctors of medicine who as a result of additional training and education have proven themselves qualified for such practice.

There is an aphorism "The best defense is a strong offense." To date the medical profession in defending private practice against the advocates of impersonal group practice and "state medicine" has not made use of an offensive. It has given the impression the status quo is all that could be desired. If this were the case, there would be infinitely less discussion of the costs of medical care, etc. Would we not strengthen our position by admitting that all was not well? By doing what we can to remedy the situation in a manner that will best produce the desired results?

If this analysis of the situation with respect to the rendering of medical service is correct, the medical profession should undertake a campaign to convince both the doctors of medicine and the public that the family doctor is not a general practitioner, a jack of all trades and master of none, but the most fundamental if not the most important of specialists, "the man behind the gun."

TREATMENT OF HEAD INJURIES

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The treatment of head injuries is gradually becoming more or less standardized and although the mortality rate is still high, much has been done to reduce it by means of conservative methods. The general practitioner is commonly called on to take care of these cases and it must have

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been a source of confusion to him in the past to have been presented with so many conflicting opinions from experts. In the short time at our disposal, it will only be possible to give a very brief resume of the treatment. This resume should be considered to be a mixture of the various methods adopted by surgeons who are best trained in matters dealing with the nervous system. Naturally the best results will be obtained by the doctor who understands most thoroughly what is taking place within the cranial cavity after injury. Each case varies from the next and insofar as the condition varies so should the treatment be altered to suit the needs of the case. Nevertheless certain generalizations should be possible and for the purpose of this discussion the cases will be divided into the following three groups:

1. Patients with a fatal injury.
2. Patients with a non-fatal injury.
3. Patients who may have a fatal or a non-fatal injury.

Although this classification seems to involve an element of prescience on the part of the medical attendant, the actual cases admitted to the emergency service of a hospital will fall readily into these groups.

It is necessary to mention that the fracture of the cranial bones is not in itself a matter of great importance, but that the real essential is the damage to the underlying brain and its vessels. It is obvious also that a blow sufficiently severe to fracture the skull may have the necessary force to cause severe cerebral damage. In addition, it should be mentioned that the word "shock" will not appear in this paper as its use is so bizarre and its mechanism is not understood in head injuries. The word collapse will be used instead.

A very brief clinical picture of the patients in the three groups is given. They will be readily recognizable by anyone with even a limited experience of these cases.

1. *The Patient with a Fatal Injury.* He is brought in in profound collapse, very severely injured—there may be multiple injuries. He is in deep coma and is obviously in *extremis.* He either dies on the way to the ward or within the first few hours after his arrival there.

2. *The Patient with a Non-fatal Injury.* He is brought in in a semi-conscious condition. He may be in a slight degree of collapse. He is very restless, irritable and irrational—repeated painful stimuli cause an appropriate response. The patient may be relatively conscious but dazed and may be able to talk coherently.

3. *The Patient Who May Have a Fatal or a Non-fatal Injury.* The coma is relatively deep; there is a marked degree of collapse; the reflexes are absent; the pupils react very poorly to light; painful stimuli may cause movements of the extremities; the pulse after a few hours becomes slow and bounding; the blood pressure is fairly high and shows a tendency to rise—he is liable to be in this condition for many hours and even days.

Treatment. The Severe and Probably Fatal Head Injury. For the first few hours the treatment should be expectant. The first consideration is to treat the collapse. This is best done by (a) application of external heat, i.e., pack the patient with hot-water bottles outside a blanket. (b) Give caffeine sodium benzoate 7½ grains when occasion arises. (c) Start fluids subcutaneously—either 5% glucose in saline or normal salt solution; do not give over 1000 cc. (d) If the solution is available, either 400 cc. of 25% glucose in saline or 500 cc. of 20% glucose in saline can be given intravenously to counteract collapse and cerebral edema. If the patient lives longer than a few hours he should be treated as in class 3.

The Patient with a Non-fatal Injury. The condition of the patient with this type of injury is comparatively good. He responds in varying degrees to loud questioning, he is irrational and restless. His blood pressure and pulse are relatively normal and he moves all his extremities.

Here again the treatment should be symptomatic and expectant. (a) Give sedatives such as 1 grain of codeine by hypodermic injection or 2 grains of codeine by mouth—or 1.5 grain of phenobarbital. These can be given every four hours as occasion arises. Never give morphine to a patient with a head injury as it depresses an already depressed respiratory center. As a last resource, paraldehyde may be given — a drachm repeated every fifteen minutes if necessary. Amytal and, to a lesser degree, nembutal appear to cause delayed excitement in some persons and therefore should not be used. (b) Apply one or more kinds of restraint—either fasten the legs in anklets or have side boards put on the bed. Many of these patients are so restless that

they fall out of bed or they are so disoriented that they may wander around the ward and even fall out of windows or down stairways. Not a few of them are under the influence of alcohol. These patients should be observed several times a day to determine whether they move all their extremities and to guard against the insidious onset of coma. (c) When the patient is tractable and quiet a lumbar puncture may be done to ascertain the presence or absence of blood in the spinal fluid. The treatment of a patient with blood in the spinal fluid must be more rigid and the prognosis more guarded than in a patient whose cerebrospinal fluid is clear. (d) Rest in bed—the patient with bloody spinal fluid should usually be kept in bed a week or ten days after he is symptom-free, whereas a patient with clear fluid may be allowed up when he is symptom-free.

The Patient in Whom the Prognosis is Indeterminate. Collapse should first be treated as outlined in the care of the patient with a fatal injury. After a few hours the patient will present somewhat the following picture: Fairly deep coma—pupils equal but react sluggishly, if at all, to light—the reflexes are present—the pulse is slow and bounding and the blood pressure is relatively high—there is usually involuntary urination but retention may occur. The patient's condition remains unchanged for the first six to twelve hours and his fate seems to hang in the balance. The patient has enough resistance to live several hours and the injury is not sufficiently fulminating to cause death quickly; both the resistance of the patient and the less severe nature of the injury indicate that well-planned therapy may be of material help. The primary cause of death is increased intracranial pressure with terminal failure of the medulla. The increased intracranial pressure is due in the first few hours to hemorrhage and later to a combination of edema and hemorrhage. Anything which can be done to relieve the increased intracranial pressure will relieve the medulla and prolong the life of the patient. The life of the patient may be prolonged until the increased intracranial pressure has been permanently relieved and the medulla is no longer in danger of being compressed.

Active treatment is directed toward the relief of increased intracranial pressure:

(a) Intravenous injection of hypertonic fluids —400 cc. of 25 per cent. or 500 cc. of 20% glucose should be injected twice a day—say at noon and midnight.

(b) Lumbar puncture should be done at say 6 A.M. and 6 P.M. This can be most scientifically done with a spinal manometer and it is best to halve the pressure. If a manometer* is not available 40 or 50 cc. of bloody spinal fluid should be removed. Naturally the patient who is draining spinal fluid from the ear or nose will not need lumbar puncture.

(c) Decompression—if after forty-eight hours of the above treatment the patient's condition is still unchanged, right subtemporal decompression should be considered. The decompression should be wide (3 inches in diameter) with a wide dural opening.

(d) General management: 1, Elevate head of the bed. 2, Change the patient's position frequently. 3, Chart pulse and blood pressure frequently (at least every hour) and preferably on the same chart. If they remain parallel the prognosis is temporarily good. If they move apart, the pressure within the cranial cavity is increasing and drastic measures must quickly be adopted. If they then run rapidly together, i.e., falling blood pressure and rising pulse associated with deep coma, the medulla has failed and the prognosis is hopeless. 4, Give appropriate cardiac stimulants. 5, Give appropriate sedatives for restlessness—never morphine. 6, Observe the patient frequently and by supraorbital pressure ascertain whether he moves all four extremities, and attempt to estimate by his reactions to loud questions whether his state of consciousness is improving or becoming worse.

Many other methods of reducing intracranial pressure have been suggested but those mentioned above appear to be the most generally useful at this time.

Extradural Hemorrhage. The medical attendant is in constant fear that he may miss a case of middle meningeal hemorrhage. The classical description of this syndrome includes an injury to the head with unconsciousness lasting from a few minutes to a few hours. There is then a

*A manometer can be made with a piece of narrow bore glass tubing 33 cm. long; bend the last 3 cm. to a right ankle and apply about 4 to 5 cm. of rubber tubing with an adapter for the spinal puncture needle. Halve the distance the bloody fluid rises in the glass tubing.

return to consciousness and possibly to normality, though usually the patient is excited and restless. This lucid interval lasts for a few hours to be followed by gradually increasing coma and death. While this description may hold true for some cases, there are many cases of extradural hemorrhage in which it does not occur.

On *a priori* grounds a lucid interval need not occur, for an injury sufficiently severe to cause an extradural hemorrhage may be severe enough to cause an intradural hemorrhage and cerebral edema. Because of the latter the patient may never regain consciousness as in the classical description and unless he be carefully observed the evidence of extradural clot may go unnoticed. Many cases every year go through this atypical syndrome and a few of them come to autopsy. In about 10% of cases of head injury coming to autopsy, extradural hemorrhage is regarded as the principal cause of death. It seems highly improbable that, if the patient had presented the classical picture, they would not have been recognized.

It appears then that not all cases, perhaps not even the majority, of extradural hemorrhage go through what has been described as the typical pattern. The only reliable indication appears to be the gradual onset of hemiplegia whether the patient has a lucid interval or not. The hemiplegia practically always develops in the first forty-eight hours. Hence, it is necessary to be sure that the patient moves all four extremities on admission and that he continues to be able to move them. In the unconscious patient this can be ascertained by firm pressure on the supraorbital nerve at which the patient will make more or less purposeful attempts to remove the painful stimulus. If hemiplegia be present, the affected side will not be moved. This early onset of hemiplegia combined with deepening coma and possibly a dilated pupil on the side of the lesion, constitutes the most reliable indication for operative interference. Should the spinal fluid be clear in the presence of this syndrome, the hemorrhage is almost certainly extradural; but if the spinal fluid be bloody it is of no diagnostic value for, as mentioned above, a violence sufficient to cause extradural bleeding may be sufficient to cause intradural bleeding. Extradural hemorrhage has occurred without fracture of the cranial bones. The presence or absence of extradural hemorrhage can easily be ruled out by placing a burr hole in the appropriate part of the skull under local anesthesia.

Hemiplegia or monoplegia may be caused by depressed skull fractures but, of course, in these cases the paralysis is present from the moment of the injury.

Injury to the Cranial Bones. The injury to the cranial bones in by far the majority of cases is at the base of the skull. The reason for this can easily be seen by examining the base of the skull and noting the thinness of it and the many foramina which weaken it in this region.

Fractures of the vault are not nearly so common and they fall into two types:

(a) Linear fracture, simple or compound.

(b) Depressed fracture, simple or compound. Comminution, in fractures of the cranial bones, does not present a special problem. Depressed fractures are nearly always compound.

(a) The treatment of simple and compound linear fractures depends on the condition of the patient and the presence or absence of x-ray pictures. Collapse should be treated first and after the collapse has passed off, a scalp wound may receive attention and if while the wound is being treated it be determined that the fracture is a linear one, nothing further need be done. X-ray pictures may be taken later when the patient's condition warrants his being moved.

A simple depressed fracture may be elevated, if it be thought necessary, any time in the first few days after the accident. In adults depressed fractures, especially in the frontal region, frequently give rise to epilepsy and it is therefore wise to elevate them unless there is a definite contraindication.

(b) Compound depressed fractures should be operated upon as soon as collapse has passed off, or operation should be delayed until the scalp has healed and sepsis is no longer considered to be present. This usually means waiting two or three weeks. Operations on patients who may have a fatal injury are not indicated. The procedure can be carried out under local anesthesia by means of a field block at a distance from the injured area. The original laceration should be extended to obtain a good view of the bones—depressed bone should be elevated and fragments removed. If the dura is intact, nothing further

should be done—if the dura be lacerated, a drain should be inserted through it and left for forty-eight hours. It is useless to follow injuries into brain tissue unless there be definite evidence of a foreign body near the surface.

The treatment of the scalp wound consists of shaving the hair at least 1 inch round the cut and cleansing it thoroughly with alcohol and iodine. The edges should be freshened by clipping off necrotic tissue with scissors, and, after examining the exposed cranial bones, the wound should be closed with a few interrupted sutures. If the sutures be well placed and the galea aponeurotica be taken in each stitch, it will not be necessary to pay attention to individual bleeding points. The scalp is very resistant to infection on account of its generous blood supply; nevertheless, care and accuracy are essential.

The treatment of brain injuries and skull fractures in children differs somewhat from that of adults. Children have the most amazing recuperative power and after collapse has passed off it is rarely necessary to do anything but observe them. Occasionally intravenous glucose and spinal puncture are indicated but decompression practically never. Simple depressed fractures are usually best left alone, at least temporarily, unless there be definite evidence of involvement of cerebral substance. Compound depressed fractures should be treated as in adults. However, frequent observation is necessary as even a child may develop an extradural hemorrhage.

DISEASES WHICH PRESENT SIGNS OF OVER-IRRITATION OF THE SYMPATHETIC NERVES AND THEIR TREATMENT BY X-RAYS

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Evidence of disturbances of the vegetative nervous system (V. N. S.) are found at some time in most diseases, as regulation and coordination of the vital processes in a human body are governed by this system which was described and named by Bichet as early as 1800. Only since the extensive morphological studies of Gaskell (1886-1889) and the physiological studies of Langley and Dickinson (1889) have we begun to study this system with better understanding. We are now beginning to select certain diseases which may be provoked by a primary disturbance of the V. N. S. We are able already to state tentatively that a weak V. N. S. may be inherited and that such a type of patient will easily show marked disturbances initiated by shock, toxins, lack of proper internal secretions, strain of life, infection, etc. Already in 1885 Edward Long Fox was able to write a book on the influence of the sympathetics on diseases.

Personal observations from 17 years of roentgenotherapy to investigate the effect of radiation on the V. N. S. have given results which will appear new to many physicians but which may help to elucidate the origin of certain diseases as produced primarily by an over-irritation of the V. N. S. The intimately close connection of this system with the glands of internal secretion makes it more difficult to decide the primary disfunction in diseases. In other words, is it the glands of internal secretion which influence the V. N. S. or is it the V. N. S. which influences the glands of internal secretion? We believe that the study of the effect of radiation will help to solve this problem and the the purpose of this paper is to attempt to show the beneficial effect of x-ray treatment in diseases which present signs of over-irritation of the sympathetic nerves and therefore to consider the idea that, in certain diseases, the over-irritation of the V. N. S. must have been the primary cause. We think that the study of the V. N. S. has been neglected and too much emphasis has been laid to the primary effect of glands of internal secretion.

The student of the V. N. S. will be surprised to find that the English medical profession was more interested in investigating this system than that of any other country, but the British interest can be explained as the result of their colonization efforts in India.

From Indian history we find that in early Buddhist periods the Yoga cults and practices actually knew the importance of the V. N. S., and in their religious exercises, which are still practiced in this vast territory chiefly among followers of the northern Tantricism, the cult was taught to acquire its domination. The Tantrik Buddhists knew well the motor and sensory nerves; the V. N. S., however, was regarded as

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*Deceased September 28, 1935.

the most important. The vital force of Kundalini, always illustrated as a dormant serpent, had to be aroused to ascend from a lower center finally to reach the brain. The center of this system was expressed in their drawings and statues as the third eye. Such a person who achieved the power of control of his entire V. N. S., therefore, dominated his body by Kundalini. I had, in my student days, the good fortune to observe in the Anatomical Institute of Leipzig under Prof. Spalteholz such an individual who demonstrated with great ease the strange faculty of dominating his V. N. S. He produced contraction of the pupil in one eye and dilatation of the opposite pupil, and he could reverse the condition at will. He could perspire on one arm and produce goose pimples on the other and he could even stop his heart from beating. It was, therefore, only natural that when, in my younger assistant years in the x-ray department of the University of Erlangen (Seitz and Wintz) the following phenomenon occurred, I attributed it to the effect of roentgen rays on the V. N. S. A boy was sent to the department for x-ray treatment for multiple warts on both hands. Only one hand received x-ray treatment, but in three weeks the warts on both hands had entirely disappeared. Disappearance of warts after a form of auto-suggestion is well known.

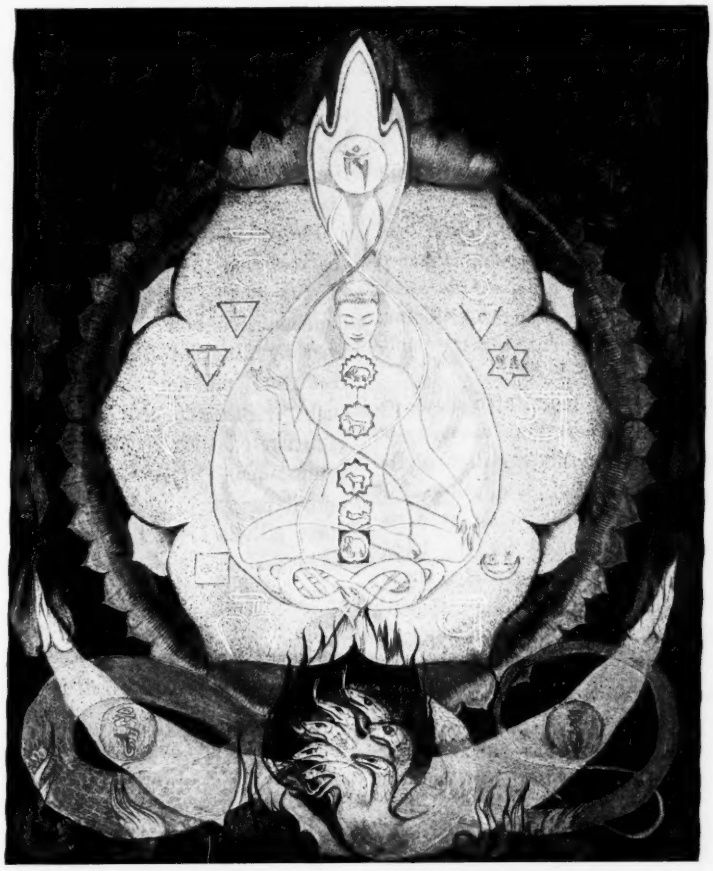

Fig. 1. An image interpreting in a traditional Tantrik way the essence of Kundalini teachings and illustrating the nervous systems "Ida" and "Pingala" curling around the "Sushumna" like the two serpents of the caduceus of Mercury. A succession of main psychic centers is indicated on the "Sushumna" which may be likened to the vegetative nervous system, whereas "Ida" and "Pingala" correspond to the sensory and locomotor systems.
—Painting by A. Avinoff.

The distant effect of roentgen rays has been reported in the literature but no satisfactory explanation has been given. Animal experiments never gave satisfactory results because a normally functioning V. N. S. is not influenced by x-rays of therapeutic doses. The final results of laboratory experiments of isolating the vagus and sympathicus at the neck in rabbits, cats and dogs and irradiating such isolated nerve fibers demonstrated the following principles:

1. A normal sympathicus or vagus cannot be altered by x-ray in therapeutic doses.

2. An over-irritated sympathicus illicits first excitability, a condition which has been described by us as Stage I, and second, a depressing effect of radiation as Stage II, producing equilibrium or, if the dose was not sufficient, a corresponding swing toward equilibrium.

The fact, that only an over-irritated V. N. S. can be brought into balance allows us today to draw certain conclusions of the condition of the sympathicus at the moment of irradiation. For instance, if a patient receives x-ray over the pelvis and lower lumbar region for the treatment of a hypertrophic prostate and if a simultaneously existing endarteritis obliterans with a marked intermittent claudication disappears after such treatment, (Philipps and Tunic) then the explanation, which has withstood severe criticism, is that over-irritated lumbar ganglia and nerves have been brought to normal function and the over-irritated sympathicus which was the cause of the intermittent claudication is now functioning normally again. Another way to determine if a disease is connected with an over-irritation of the sympathicus is to study surgical reports where ganglionectomies, sympathectomies, trunk resections, have been reported as successful in various afflictions of the body. From careful investigation of the surgical operations on the V. N. S. and from roentgenological reports, a large group of diseases have been assembled which must be connected with or produced by an over-irritation of the sympathicus.

The recognition that a disease is connected with an over-irritation of a part of or the entire V. N. S. enables us to produce a definite improvement of such disease after x-ray therapy and it is, therefore, worth while for every physician to know this. To use x-ray therapy prior to surgical ganglionectomy, sympathectomy, etc. should find favor because of the small and therefore harmless amount of x-ray which we advocate and also because of a high percentage of good results which makes a surgical procedure unnecessary. The remarkable correlation between internal secretion and V. N. S. has already been mentioned, but in certain instances of marked disturbances of a gland of internal secretion an underfunction of the V. N. S. exists instead of over-irritation, and this facilitates the recognition of an entirely different group of diseases.

The greatest confusion was brought about in the roentgen literature through the introduction of the term "irritation dose." In 1923, we demonstrated how the term irritation dose was used by different investigators in a most contradictory manner and we demonstrated that such "irritation" does not exist. It must be remembered that an increased irritation of the sympathicus (Stage I) is only a temporary state and it passes, in a short time, into a depressed stage (Stage II). In other words, radiation always produces depression. It is fortunate that most roentgen therapeutics today have come to the same conclusion. An interesting animal experiment was reported recently by Schatz. It is possible to produce estrus through implantation of fresh anterior pituitary lobe into infantile mice (Zondeck and Ascheim). In 100 hours after such implantation an infantile mouse has become mature with typical changes of the ovaries. If x-ray would be able to stimulate and produce that same estrus as that from the anterior pituitary lobe implantation, it should be observed in the infantile mice. Schatz, treating 40 infantile mice with different roentgen doses, was unable to stimulate ovarian production and, therefore, concluded that a stimulating dose of x-ray on such ovaries does not act as the hormone did.

Our investigation leads us first to skin diseases. That a certain group of them has been considered to be connected with an irritation of the sympathicus can be found in any textbook of dermatology. It is interesting to note that the roentgen literature reports most satisfactory results in such cases. We are more interested to find reports in the roentgen literature which speak of the indirect effect of radia-

tion; reports that did not recognize the effect of radiation on the V. N. S.

Some clinical signs are explained or accepted as being produced by an over-irritation of the V. N. S., as, for instance, trophic changes in the skin, transudation and exudation of the skin, and changes in the skin which are symmetrically situated and accompanied by itching. We remember that many medications which are applied in the form of salves have been found to subdue the itch by paralyzing the end fibers of the sympathicus. The disappearance of itch after ultraviolet irradiation was said by Rothmann to be due to the paralyzing effect of ultraviolet on the end-fibers of the sympathicus of the skin. Jessioneck and others found Rothmann's statement to be correct. X-ray, as we have already published in 1927, has the same direct effect but a longer and more lasting paralysis. Publications dealing with the indirect effect of roentgen radiation in skin diseases appeared as long ago as 1913. Zimmern reports curing pruritis ani and vulvae by irradiating the lumbar region and a few years later he reported that lichen planus disappeared promptly after irradiating the cervical or dorsal spine. He speaks of a "radiotherapy radiculaire" using filtered radiation and repeated treatment. Gouin and Bienvenue, using unfiltered radiation to the skin above the diseased part but corresponding to the area in which the nerves pass down to that part of the body, also reported satisfactory results and observed increased itching (Stage I) for a short time after such irradiation and before the papulae disappeared and itching stopped (Stage II). Driver, having used both techniques, comes to the conclusion that paravertebral technique with filtered x-rays gives better results. It should be said here that skin specialists, finding failure with such treatment, should remember that the better results will be obtained by using the more penetrating radiation and greater filtration because the paravertebral ganglia are rather deeply situated. Our experience with the treatment of lichen planus from the standpoint of quieting down an over-irritated V. N. S. has made us believe that an ideal roentgen technique for lichen planus has not yet been outlined. The following example might be of interest:

Mr. S. A. W., 44 years of age, referred by a dermatologist, with the exception of the face and neck, was covered with typical lichen planus patches. The itching had made sleep practically impossible for weeks. The patient had been treated in another city over the chest and abdomen with unfiltered roentgen rays but without much benefit. This patient was treated first over the centrum and the cervical ganglia instead of the first dorsal to the sacrum paravertebrally with 250 r each field, 200 K. V. using a filter of 0.5 mm Cu and 1 mm Al over fields 7 x 18 cm in size as is customary. He received 350 r filtered through 0.5 mm Cu and 1 mm Al, 200 K. V. on each side of the neck including in this field the region of the diencephalon. When he returned the next day to continue the paravertebral treatment, he reported such improvement that we did not give it. Six hours after x-ray application the itch had stopped entirely. The redness of the skin where the itch had been the worst had subsided slightly. The patient reported by letter that from day to day he had made rapid recovery. Recurrence had not been observed in the succeeding eight months. Paravertebral treatment from first dorsal to sacrum, without raying the centrum and cervical area, would have probably resulted in a failure. In this case we apparently had to deal with a centrally regulated disturbance, manifested by lichen planus.

Stages I and II could be clearly observed in some psoriasis patients. We gave 350 r per field, two fields a day, two cervical temporal fields, two fields from 1-7 dorsal, two fields from 7th dorsal to 2nd lumbar, and finally two fields from 2nd lumbar to sacrum.

The series was repeated a second time giving another 350 r to each field. Since Stages I and II were not always clearly observed and because of the small number of patients treated in this way an official report was not made. The report of Rieva Rosh which presents 24 cases treated with 850 r to the dorsal and lumbar region is interesting since Rosh also observed increased itch in areas distant from the irradiation parts, (our stage I). Rosh believed that the x-ray treatment of the V. N. S. influenced the thymus. She reports empirically found remarkable results. The observation of Stages I and II and the final results of such treatment influences us to correlate psoriasis with an over-irritation of the V. N. S.

Castex and Camauer have indicated by three cases of ichthyosis that this also is a manifestation of an abnormal condition of the V. N. S. We suggested in 1927 to treat such diseases paravertebrally in their earliest stages. The same seems to be in its infancy.

The treatment of certain forms of eczema probably belonging to the neurodermatitis group has been described by us in 1932. We have found

during these last two years that symmetrical eczema in women of the menopause age is greatly relieved after x-ray treatment over the neck and temporal region similar to that given for menopause disturbances. Only when such application has no effect on the eczematous condition, further application from the first dorsal downward, 250-350 r to each field is given and often found to be successful. It must be left to the skin specialist to evaluate and improve the technique. The fact of paramount interest, is that, if increased irritation after radiating such distant areas is observed (Stage I), an improvement can be expected in every case (Stage II).

The explanation of the radiation effect when certain modest results in psoriasis could be observed seemed practically exhausted from looking over the literature. Irritation of the thymus, destruction of persistent thymus with x-ray, influence on the ovary, irritation of the hypophysis, and many other explanations are offered. The hopeless therapy of psoriasis made us try the paravertebral technique. As the science of skin disease had nothing to offer, our only reason to influence a supposed over-irritated V. N. S. was in the empirically found observation that heavy ultra-violet radiation was able to make psoriasis patches disappear temporarily. Based on the knowledge derived from Rothmann, the technique used in psoriasis may prove to be of value in scleroderma but it still needs careful investigation.

Time does not allow us to discuss herpes zoster and its correlation to an over-irritation of the V. N. S., but the beneficial effect of radiation is known to all. The increased itch and malaise (Stage I) which follows the x-ray therapy in a few hours leads to a more quiescent state (Stage II) and must be connected with the influence of such radiation on the V. N. S. It cannot be explained as a destructive effect of x-ray on lymph cells which have invaded the nerve sheaths. At least the Stage I, with its temporarily increased pain, cannot find satisfactory explanation by other hypotheses. Just as the results of roentgen treatment of herpes zoster are so satisfactory as again recently reported by Keichline, x-ray treatment over the corresponding ganglia in post herpes neuralgia is equally beneficial.

Diseases belonging to the medical group which have been reported successfully treated with roentgen rays are numerous and a superficial observer might not see any uniform explanation why these apparently so different diseases should be so benefited by radiation treatment. We shall now discuss diseases which have shown improvement after paravertebral irradiation which presented distinct signs of over-irritation of the V. N. S. We would like to make the suggestions that when a combination of certain clinical symptoms or a combination of certain diseases pointing to an over-irritation of the V. N. S. can be observed in the same patient, that the primary cause of such diseases or clinical symptoms may be found in that over-irritation. As roentgen therapy is able to diminish simultaneously the entire group of clincal symptoms or the entire group of certain diseases, it is logical to assume that all the diseases were produced by the same cause. Erich Leschke, has recently published a book on diseases of the V. N. S. which is being accepted by many internists with some skepticism.

The treatment of asthma with roentgen rays is known to you all. In a previous publication we have attempted to demonstrate that the results obtained when such different parts of the body were treated could only be explained as an effect of roentgen rays on an over-irritated V. N. S. The whole system is brought into equilibrium but only a certain percentage of cures in the form of a balanced V. N. S. can be expected because of the many etiological factors of asthma. The generally accepted idea that asthma is the expression of an allergic host infers immediately the presence of a disturbed V. N. S. That x-ray therapy is able to influence asthma favorably has been reported in a great number of publications.

Hot flashes, pruritis, sudden outbreaks of perspiration, symmetrically appearing pain in the joints, muscles, or tendons, symmetrical dermatoses, cold hands and feet, cramps, etc., indicating neurocirculatory dysfunction, increase of blood pressure without kidney pathology, rhinitis vasomotorica are all signs of over-irritation of the V. N. S. and are frequently observed during the menapause. This increase in sympathicus tonus is brought about through the involuting ovaries (Langer) and that some of the other glands of internal secretion are secondarily stimulated to hyperfunction by this in-

crease of the tonus of the sympathicus has been suggested by the voluminous hormone studies.

Werner, treating the region of the hypophysis, was the first to report excellent results in menopause disorders. He explained the beneficial effect of such radiation as the influence of x-ray on the vegetative nervous centrum, but, at his time of publication, hardly anyone believed in the effect of x-rays on nerve tissues. When Borak found an 80% complete disappearance of menopause symptoms after x-ray application of the pituitary region and the thyroid, he explained the result as a depressing effect of x-rays on the function of these glands. Since we have given detailed explanation in other reports of why the effect of radiation in such cases must be primarily on the V. N. S., we will refrain here from its repetition.

We have also reported the correlation and treatment of disturbances of the V. N. S. in neuralgia and arthritis, and these cases of arthritis which showed typical signs of over-irritation of the V. N. S. yielded satisfactory results. Since then other investigators both here and abroad have corroborated this finding. In 1927 we reported our reasons to believe that x-ray therapy had essentially no effect on the thyroid gland but that the primary effect of radiation was on the V. N. S. Today, more than ever, we are convinced of this statement for the following reasons:

1. We are able to prove that in cases which present the classical symptoms of toxic hyperplasia of the thyroid gland and in which the typical x-ray treatment over the thyroid gland and thymus regions do not bring the desired results, x-ray treatment over the ganglia of the V. N. S. situated either higher or lower or both brings about a decrease in the basal metabolic rate and clinical recovery. Jugenburg reports improvement after failure of direct treatment of the thyroid gland when the pituitary region in women of the menopause period was treated with x-ray, and Zimmern reports corresponding results after treatment of the adrenal region. We have stated in 1923 that treatment over the ovaries influences also the V. N. S. and that the symptoms of toxic hyperplasia of the thyroid gland may disappear

2. Adrenal sympathectomy as reported by Crile reduces the basal metabolic rate and eradicates the symptoms of toxic hyperthyroidism in certain cases where the thyroid gland itself is not touched. (See also Zimmern's report.)

3. The recent discovery of Sunder-Plassmann seems to demonstrate microscopically that every cell of the thyroid gland is under the most minute influence of the V. N. S. Since he was unable to find any peripheral ganglia in the thyroid gland he believes that the thyroid must be under central nervous influence.

Sunder-Plassmann believes that central excitation (shock, worry, predisposition, etc.) is able to irritate the sympathicus and, in certain cases, symptoms of hyperfunction of the thyroid gland will be observed. He found that in the beginning of such hyperfunction a possibility to restore the thyroid to normal is still present and proposes resection of the sympathicus of the neck with the idea of bringing an over-irritated sympathicus into balance. In the latter stage of the disease Sunder-Plassmann proves that the over-function of these glands of internal secretion affects the end-fibers of the sympathicus to such an extent that an irreversible Basedow exists. He found in such cases that the end-fiber of the sympathicus microscopically degenerates into a clump and since such toxic hyperplastic thyroid is no longer under the control of the V. N. S. only resection of such a gland offers the patient hope of recovery.

Sunder-Plassmann calls the x-ray treatment of the thyroid gland "the bloodless resection of the sympathicus of the neck." It seems to us that the extensive research of Sunder-Plassmann will decidedly help to bring a more peaceful discussion of this subject to the surgeons and roentgen therapeutists in the near future.

The outstanding clinical symptom in toxic hyperplasia of the thyroid is increased metabolic rate. Should further investigation prove that this increased metabolic rate is a sign of over-irritation of the sympathicus and not a disease of the thyroid gland itself, roentgen therapy of the V. N. S., as we have advocated for certain other diseases, will find a broader field of activity. May we mention further that the effect of roentgen therapy in toxic hyperplasia of the thyroid gland can be assumed to be primarily on an over-irritated sympathicus for the reason that Stage I (increased excitability of the sympathicus) is always observed a few hours after the first roentgen application. In other words, the patient seems to be worse before Stage II appears.

It is not right to compare the effect of roentgen therapy to a bloodless resection of the sympathicus as Sunder-Plassmann expressed it. Our suggestion has always been to bring an over-irritated V. N. S. just into balance, if possible, and surgery seems to attempt this rather crudely

by completely interrupting the physiological pathways. Yet the pioneer work of surgery on the V. N. S. has gradually brought forth an increase in the amount of publication from roentgen therapeutists.

Phillips and Tunick made a preliminary report on the effect of roentgen irradiation in thromboangiitis obliterans in 1925 and they believed in a stimulating dose of x-ray. For many reasons including the remarkable results which Mayo and Adson found after bilateral sympathectomy, we differ with their opinion. Gilbert and Babaiantz and Pfahler have recently given their technique of treatment and seem to favor our opinion of a depressing effect of roentgen rays on an over-irritated V. N. S.

As our personal experience with x-ray treatment in Raynaud's disease is only on a few cases and the etiology is still unknow as Sir Thomas Lewis has again recently pointed out, we should refrain from any discussion. Borchard and Ostrowski demonstrated that, in Raynaud's disease and scleroderma, increased irritation of the V. N. S. exists. Cases which came to our observation showed Raynaud's syndrome in coexistence with other signs of over-irritation of the sympathicus. In such cases, we had satisfactory results after x-ray treatment over the entire V. N. S. Langeron and Desplats report recently also beneficial results treating the cervico-dorsal area as well as the region of the adrenal gland and the hypophysis.

Surgery of the V. N. S. for angina pectoris has proven the important part that an over-irritated sympathicus plays in the production of this disease. Roentgen therapy has not been used extensively enough nor in proportion to the indications. Sussmann reports 16 patients treated paravertebrally with x-ray and tabulates the results thus: Six practically free from further attacks, five slightly improved, one died, and four did not return for further treatment. Nemours observed 51 treated cases, 31 free from symptoms, eight improved, five no change, one got worse, and six died during the course of treatment.

Langeron and Desplats came to the conclusion that all patients who showed signs of disturbances of the cardiac plexus should be treated with x-rays, contraindications being only grave insufficiency of the heart, badly compensated valvular disturbances, general bad condition of the patient, or very great age.

Hehring discovered in February, 1924, the reflex of the sinus carotis. Until then the teachings of the peripheral circulation were dominated by the chemical hormone theory. The regulative influence from this sinus reflex on blood pressure, heart beat, respiration, peristalsis of the stomach and intestines, and the entire vasomotor tonus is by this neuroreceptor complex. That extensive x-ray treatment exclusively over this area brings about reduction of blood pressure in essential hypertonia has been demonstrated by Carulla, Quesalbo and Gonzales.

Kuntz states that hypertension is commonly associated with structural vascular lesions. It sometimes occurs in the absence of such lesions, however, as a result of sympathetic stimulation. The cause of such sympathetic stimulation is sometimes traceable to hygienic or dietetic variations, sometimes to acute or chronic disease processes, and not infrequently to psychic and emotional disturbances. Since the first publication of x-ray therapy for hypertension by Zimmern and Cottenot, the idea of influencing the adrenals in their secretion by this method has been used by many other investigators. The greatest experts of the so-called "radiotherapy surrenal," Langeron and Desplats, reported hardly any changes in blood pressure after such treatment but stated that dizziness and cramps disappeared and that the clinical symptoms which seemed to be connected with adrenal spasms were relieved as a result of radiation of the V. N. S. Bauer, Oliver, and others could prove that increased adrenalin secretion was not responsible for hypertonia. X-ray treatment over the adrenals from the standpoint of reducing their secretion seems of little value, according to the reports in the literature. Kylin, who has studied and written much about hypertonia, states in his different books that the real cause of hypertonia is still unknown, but that a shift in the V. N. S. exists in its presence. Kylin found, in 1921, that the great variability of blood pressure in essential hypertonia is not produced through organic changes of the peripheral blood system. He believes that three factors are responsible for producing hypertonia:

1. Blood vessel regulating centra in the brain.
2. Peripheral effect from the V. N. S.

3. Hormones produced by the adrenals and hypophysis.

Hamperl and Heller injected kaolin into the base of the fourth ventrical and were thereby able to produce chronic irritation of the vegatative nervous center and permanent hypertonia in dogs, and it closely resembled essential hypertonia in man. Hogler and others could prove the denervation of adrenals had no influence on the artificially produced hypertension in dogs, and Oliver found that even desiccation of the adrenals was unable to change the hypertonia such dogs. Our x-ray therapy for essential hypertonia dates back to the first publication of Crile on denervation of the adrenals for neuro-circulatory asthenia. Crile points out that this type of patient resembles a mild form of hyperthyroidism. A case, which was seen by the Crile clinic and which we had the good fortune to study, presented, besides a certain amount of hyperthyroidism, angiospasms of the hands and feet and an increased blood pressure. We connected these clinical symptoms with an over irritation of the sympathicus and the x-ray therapy over the entire V. N. S. including the diencephalon produced a satisfactory clinical result in this patient. From there on our investigation led us to another symptom which we assumed to be another manifestation of an over-irritated V. N. S., namely, that frequently increased blood sugar was found in such patients. Curshman stated recently that very little is known about the etiology of diabetes mellitus. He quotes Levy and Dressel who found very often degenerative histological changes in the diencephalon. Curshman believes in an hereditary influence for the diabetic patient and a neuro-traumatic origin for some of them. Anatomical findings prove that diabetes mellitus is a disease of the pancreas and lack of hormone is the outstanding factor in this disease since insulin is able to influence every diabetic patient, yet the neuro-vegetative influence must be taken into consideration. Erich Leschke was the first to insist on the nervous disturbances of the Islands of Langerhans. Donnhover and McLeod agree with Claude Bernard that the irritation set up the Piqûre rather than the destruction of some center or pathway is responsible for the hyperglycemia effects which follow. Their animal experiments are summed us as follows: "when decerebration is performed in rabbits during the short period of anesthesia induced by the intravenous injection of amytal, marked hyperglycemia supervenes within two hours provided that the pons is involved. Decerebration anterior or posterior to this region seldom has any effect on the blood sugar level, except when it involves a nervous portion of the medulla adjacent to the pons. It is possible that the nerve control acts by causing an increased secretion of adrenalin when the blood sugar tends to fall, or of insulin when it tends to rise, but there is, as yet, no unequivocal evidence in support of such a hypothesis."

Erich Leschke, insisting that the production of insulin is essentially regulated through the V. N. S., points out that the pancreas of some patients who have died in a diabetic coma often contains enough insulin to regulate carbohydrate metabolism for more than a week. Our reasons why x-ray treatment in certain cases of diabetes mellitus should be directed primarily to the V. N. S. are the following:

1. Generalized pruritus in diabetes is a sign of over-irritation of the end-fibers of the sympathicus in the skin and it is influenced by paravertebral x-ray treatment.

2. In diabetic gangrene, paravertebral treatment produces a better circulation in the affected extremities. Dilatation of the arteries is produced by depressing the over activity of the sympathicus.

3. Paravertebral treatment in diabetes mellitus increases the amount of blood sugar and also urine elimination, and both phenomena were called by Desplats (one of the first who treated diabetics with x-ray over the adrenal region) paradoxical but they now can be explained as a stage I reaction.

4. The essential hypertonia which exists in 25-35% of all diabetic cases, as reported by Peisler, Kylin and Maranon we believe to be due to an over-irritation of the V. N. S.

At this point let us draw an analogy between the pathology of diabetes mellitus and Basedow's disease. We have already mentioned the remarkable work of Sunder-Rassmann who drew the conclusions that unless a sympathectomy was performed or x-ray therapy was administered in early cases of toxic hyperplasia of the thyroid gland, the end-fibers of the sympathicus in the gland become clumped and then irreparable damage is present. Quite frequently from laboratory examinations we find some patients with abnormally high blood sugar and we may also find a glycosuria. The laboratory indication is that the patient is suffering from diabetes mellitus, but this diagnosis had never been made before. May we not indulge in an interesting speculative analogy by comparing this patient to an early case of hyperthyroidism? If this

patient now is not given x-ray therapy or does not undergo some surgical procedure on the V. N. S., will not the sympathetic end-fibers in the pancreas also become "clumped" and thus develop irreparable damage?

Hutton has given a great stimulus to all of us in his many publications on radiotherapeutic treatment of hypertension and diabetes. We note with satisfaction in some of his cases an increase of blood pressure after x-ray treatment and then disappearance of many clinical symptoms such as menopause disturbances, rheumatic pain, increased basal metabolic rate and other signs which are so closely connected with an over-irritation of the V. N. S.; and even if we differ on the point of primary effect of the radiation, Hutton has given roentgen therapy a very important contribution in proving what can be done in hypertonia and diabetes mellitus with a certain technique of roentgen application. He has, at the same time corroborated our findings at which we arrived from a different angle, but with the same gratifying results as reported by him. "The fact remains," quoting Hutton, "that the patients can be relieved at least to some extent from their disability."

We note that, so far, certain clinical symptoms in internal disease assumed by us to be connected with an over-irritation of the sympathicus were treated with the same idea in mind, namely, to decrease such over-irritation of the V. N. S. with roentgen rays. There remains only one group of internal diseases where roentgen treatment has produced satisfactory results and that group is the blood dyscrasias. To connect them also with an over-irritation of the sympathicus and therefore to make their logical treatment x-ray therapy over the vegetative nervous center and ganglia has been reported by us and will be published shortly. Briefly we have found that paravertebral x-ray in small doses has proven very effective in the control of myeloid and lymphatic leukemia, polycythemia rubra vera, and Hodgkin's disease, if this, too, may be considered a blood dyscrasia. Those diseases of the blood which show hyperfunction of the blood producing organs can be influenced by radiation. As transformation from one blood dyscrasia into another has frequently been reported and described, it certainly is possible that only one factor may be responsible for the overproduction of the elements of the blood. Evans and Leucutia pointed out that lymphatic leukemia, pseudoleukemia and lymphosarcoma all respond to the same amount of x-ray with the same beneficial effect at essentially the same time interval after treatment. They therefore conclude, like others, that these diseases are only different expressions of a single disease for which we now present a good working hypothesis. That emotional strain is able to increase certain constituents of the blood and to produce evidence of other forms of stimulation of the sympathicus has been reviewed by Kuntz. The well-known effect of massive doses of x-ray producing leukopenia has been found by Parrisius to be an actual diminution of the white corpuscles in the blood stream and not a shifting of peripheral blood to the abdominal organs. The passing leucocytosis after roentgen irradiation before the leukopenia sets in, has never been satisfactorily explained. If we can accept the primary effect of the x-rays as being on the V. N. S., then the leucocytosis can be explained as a Stage I reaction which is followed by Stage II reaction found in the form of leukopenia. The increase of the red corpuscles in polycythemia rubra vera immediately after x-ray application, has been observed by many investigators. Basal metabolic rate is nearly always increased in these diseases as Friedgood and others have already pointed out. Friedgood believes that in leukemia an over-irritated V. N. S. must be present. Schlossmann, Baldridge and Barer found in their laboratory work that increased basal metabolic rate is not produced through the rapid breaking down of blood corpuscles in these diseases, and Menard demonstrated that basal metabolic rate is increased before the increase of blood corpuscles can be observed. The effect of the over-irritated V. N. S. on basal metabolic rate has already been discussed. Rosenow irritated the region of the centrum of the V. N. S. and produced leucocytosis and Schulhoff and Matties produced chronc irritation of the centrum by injecting silica in this region and observed an increase of red blood corpuscles in rabbits which led them to believe in a red blood regulating center in the brain. The x-ray therapy proposed by us in the form of treatment over the entire V. N. S. has produced, in every case, a result which at least must be called equal to the best results obtained with the old technique.

Clinical signs indicating a disturbance of the V. N. S. have been described. It is suggested that patients with more than one clinical sign of disturbance of the V. N. S. can be influenced by roentgen irradiation over such system with a satisfactory result. Careful clinical studies of patients who show only one outstanding symptom of an over-irritation of the V. N. S. will often reveal more signs if more are sought. Musser and Wright reported hypertension, obesity and hyperglycemia in women. Fat tissues are under neuro-regulation as has been described by Wassermann, Hausberger and others.

A single case came to our attention which displayed six different pathological entities, namely, Raynaud's disease, myeloid leukemia, carcinoma of the breast, hyperthyroidism, hyperglycemia, and symmetrical pigmented nevi of the abdomen. All of these conditions have been controlled for the last sixteen months by paravertebral x-ray treatment with the idea in mind of reducing an over-irritation of the V. N. S. The breast, of course, received direct treatment S. must be present. Schlossmann, Baldridge in addition. The fact that paravertebral treatment brought about this improvement substantiates our opinion that this result was due to the effect of radiation over the V. N. S. It clearly demonstrates the possibilities of roentgen therapy, and harmonious collaboration of roentgenologists and internists may help to solve many interesting problems in disease.

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CARDIAC REVIEW OF 1935

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General Remarks: Reynolds[1] stated that the restrictions imposed upon the patient with a damaged heart at any age should be approached with a joyous attitude toward all he can do, not a pessimistic emphasis on all that he cannot do. Cohn[2] analyzed the apparent increase in the heart diseases from which the following inferences were drawn: 1. There has been a rise, but a slight one only, in the death rate from circulatory diseases; 2. Changes in the diagnoses which have been employed account in part for the interpretation which has been placed on the course of events; and 3. The slight rise in the total death rate from circulatory diseases is due apparently to savings from deaths resulting from infectious diseases in the very decades in which the slight rise in the circulatory diseases has occurred. Stroud[3] emphasized the need for the rehabilitation and placement in industry of those handicapped with cardiovascular disease.

1. ANATOMY AND PHYSIOLOGY

Blair and Davies[4] demonstrated the muscular nature of both the S-A and A-V nodes, and also the presence of nerve fibers with intraprotoplasmic endings in the tunica media of the branches of the coronary arteries. Katz, Mayne, and Weinstein[5] presented experimental evidence to indicate that cardiac pain is due to the presence of pain fibers in the nerve plexus surrounding the coronary vessels. Weiss and Ellis[6] tested the oxygen utilization and lactic acid production in the extremities during rest and exercise in subjects with normal and diseased cardiovascular systems from which they concluded that disturbances in the lactic acid production and peripheral circulation were the result and not the cause of the heart failure. Harris, Jones, and Aldred[7] reported that under resting conditions the lactic acid in the blood was increased in definite relation to the degree of congestive heart failure. Resnik and Friedman[8] stated that the basal metabolic rate was elevated in many patients with congestive heart failure and declined as improvement occurred; the chief factor in this mechanism appeared to be the increased work of the muscles of respiration but the

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diminished mechanical efficiency and consequent increased energy expenditure of the diseased heart also played an important role.

2. METHODS OF CARDIOVASCULAR EXAMINATION

1. *Heart Sound Records:* Bierring, Bone, and Lockhart[9] made a preliminary report on an electrostethograph as a satisfactory method of photographing heart sounds, a small compact unit entirely portable, and of distinct value as a supplement to auscultatory observations as well as providing a permanent graphic record. Schwarzschild and Feltenstein[10] presented a new type of recording apparatus which possesses distortion simulating that of the human ear so that it permitted strict correlation between clinical cardiology and phonocardiographic records. Johnston[11] illustrated the value of these records in the diagnosis of mitral stenosis, especially in the early cases which had low pitched murmurs difficult to hear, and also in well advanced cases where the apical heart sounds heard on auscultation were difficult to interpret.

2. *Electrocardiography:* (a) *Standard Three-Lead:* Proger and Minnich[12] indicated that left axis deviation without any other changes in the tracing does not indicate associated myocardial disease. Goodman[13] illustrated by means of unusual electrocardiograms evidence to support the theory that the heart responds to the rhythm center which develops effective stimuli most rapidly. Katz, Saphir, and Strauss[14] emphasized that left axis deviation occurred in graphic tracings of three cases of brown atrophy of the heart so that axis deviation by itself could not be taken as evidence of cardiac hypertrophy. Willius[15] indicated that the electrocardiograph may be a valuable diagnostic adjunct in the anginal syndrome of coronary sclerosis and when properly interpreted, becomes a method of precision indispensable in the complete scheme of cardiac diagnosis. Barnes[16] reported that it was the situation of the acute infarct in the left ventricle and not the vessel supplying the area that determined the character of the resulting electrocardiographic changes; these changes appeared as early as from one to two hours after the acute coronary occlusion, and the electrocardiogram did not return completely to normal in some instances for two or three years or more. Richter[17] demonstrated the value of serial electrocardiograms in coronary thrombosis as only two of his 72 cases in which serial curves were taken failed to show significant changes in the tracings. Feldman and Kornblum[18] correlated the anatomical findings with abnormalities of the Q wave in Lead 3; a deep Q_3 was a very frequent finding in cases of old or recent myocardial infarctions. Graybiel and White[19] reported significant inversion of the T-wave in the electrocardiogram not associated with the usual causes; T-wave inversion was noted in young individuals with neurocirculatory asthenia, with thyrotoxicosis, in relation to certain infections, and following paroxysmal ventricular tachycardia. Dauksys[20] noted temporary flattening of the T-wave associated with pleural effusions. Schwab and Herrman[21] presented seven cases of pericardial disease of various types and again indicated the similarity in the electrocardiogram between pericardial effusion and coronary thrombosis with infarction; the occurrence of progressive changes in the T-wave in acute fibrinous pericarditis without an accompanying effusion and without any previous abnormalities in the RS-T segment was emphasized. Hinden[22] reported that the U-wave occurred in two forms, either as a sharp peak immediately after the T-wave or the succeeding P-wave; both types were found in health and in a great variety of pathological conditions. Uhse[23] noted that antirachitic therapy with various preparations had an influence on the electrocardiograms of children not unlike the changes seen in the postinfectious states. Lewison[24] stated that the electrocardiogram can play an important role in the control of children afflicted with active rheumatic heart disease where the conducting system is involved as a partial heart-block cannot be diagnosed clinically.

(b) *Lead IV, Chest or Precordial Leads:* Roth[25] thoroughly reviewed the literature on the use of chest leads in clinical electrocardiography and concluded that while these leads have found a permanent place, standard leads are still to be regarded as more dependable, and a parallel study of standard lead tracings, particularly with reference to minor deviations, should be pursued with at least as much attention as the study of chest leads. Strauss and Katz[26] studied the effect of digitalis on the appearance of Lead IV in digitalized normal and cardiac patients and noted that digitalis in large doses produced rapid changes in Lead IV which occasionally resembled

those seen in coronary occlusion. Goldbloom[27] reported four cases of coronary thrombosis in which there were persistent abnormal Lead IV findings in serial electrocardiograms with negative routine standard three-leads. Levy and Bruenn[28] indicated that in rheumatic fever, if successive electrocardiograms were taken, the precordial lead would furnish evidence of active carditis when changes indicating active myocardial involvement were not observed in the standard three-leads; on occasion, changes denoting rheumatic lesions in the heart muscle were present in the standard three-leads when no changes were apparent in Lead IV.

3. Roentgenography: Warfield[29] recorded 20 cases of aneurysm of the innominate artery which were diagnosed when a right-sided tumor in the superior mediastinum with associated aortitis was viewed; in the lateral and oblique positions a fusiform shadow was seen originating at the arch of the aorta, bulging posteriorly, so that compression of the trachea was a constant finding. Brown and McCarthy[30] reported that enlargement of the heart from any cause encroaches on the posterior half of the thorax and displaces the esophagus backwards; in lesions of the mitral valve the esophagus is displaced to the right and backwards, and in lesions of the aortic valve it is displaced to the left and backwards. Schwedel and Gutman[31] presented a case of unusual displacement of the esophagus due to adhesions to the heart and aorta in a 56 year old female who died of hypertensive heart disease of two years duration but had no difficulty in swallowing. Shiflett[32] reported two cases of localized pleural effusion accompanying congestive heart failure; on the roentgenogram the effusion was usually sharply localized to the interlobar fissure or to one lobe, and in all the cases reported it has occurred on the right side.

4. *Other Methods:* Wartman[33] stated that an increased venous blood pressure was observed only in patients suffering from congestive heart failure or mediastinal obstruction; of the patients with a venous pressure over 250 mm. of water, 69 per cent died within three months, whereas only 8 per cent of those with a pressure below this level succumbed. Brams and Golden[34] reported that it was exceptional for either the systolic or diastolic arterial pressure to show an appreciable fall after the ordinary venesection; the same results were observed in patients with arterial hypertension as in those with a normal blood pressure. Hitzig, King, and Fishberg[35] stated that the systemic venous pressure was normal in isolated failure of the left side of the heart. Master[36] described a simple two-step test of myocardial function which was a definite aid in the diagnosis and evaluation of cardiovascular and in deciding how much work, sport, or other activity the patient was permitted. Lueth and Sutton[37] described a method of evaluating cardiac pain in children; those who did not experience pain after the simple pressure test and complained of cardiac pain almost always had demonstrable cardiac disease.

3. Symptoms and Signs

1. *Cardiac Pain:* Bourne[38] stated that an exact history was of the greatest importance in this group as the following differentiation could be made: (a) Quantitative pain, the angina of effort; (b) Spasmodic pain, the spasmodic angina; (c) Continued pain, of coronary occlusion; and (d) Pain having no specific relationships, the pseudo-angina or angina innocens. Special conditions considered were syphilitic cardiac pain, auricular fibrillation and cardiac pain, and cardiac pain in mitral stenosis. He stressed the necessity of carefully taking a history and analyzing the symptoms, and unless such a differentiation was made, research work upon the prognosis or upon the value of various therapeutic measures in cases of cardiac pain would be founded upon an insecure basis, likely to be misleading or fruitless. Wantoch[39] called attention to the connection between pains in the joints and muscles and heart disease, giving especial attention to the pseudo-rheumatic pains that frequently appeared in the shoulders and upper extremities and were related to angina pectoris; these pains were not only an accompanying symptom, but quite often the initial and for a long time the only symptom.

2. *Heart Sounds and Murmurs:* Flaxman[40] noted the variability of murmurs in 237 cases of mitral stenosis; auricular fibrillation was present in 46.6 per cent and had no effect on the character or type of murmurs audible; double murmurs were present in 76 per cent; systolic murmurs alone were present in 15.2 per cent; the murmurs of mitral stenosis were readily recognized by the characteristic rasping sound without resorting to definitely isolating the murmurs

in the cardiac cycle by timing. Friedlander and Brown[41] made further observations on the clinical significance of the systolic murmur in 100 individuals with no evidence of organic heart disease; in 47 a soft systolic murmur developed following the use of amyl nitrate, but in none did a diastolic murmur or a loud systolic murmur occur. Bramwell[42] suggested that the similarity between the first heart sound in hyperthyroidism, in certain athletes, in some cases of congenital heart disease, and in some patients with hypertension on the one hand, and the first heart sound and presystolic murmur of mitral stenosis on the other hand, may be due to an increased velocity of the blood-flow through the mitral orifice when the auricular muscle is hypertrophied. DeChatel[43] stated that the contraction of the auricle plays an important part in the development of the first heart sound because the systolic sound becomes weaker as the conduction time lengthens; in valvular lesions the changes in the cardiac sounds were not uniform, and the intensity of the first heart sound was also influenced by the respiratory movements and by changes in the rhythm.

4. Incidence of Heart Disease

Maher, Sittler, and Elliott[44] analyzed the etiologic factors in 1000 cases of heart disease in the Chicago area and reported the incidence of each as follows: Rheumatic, 29.2 per cent; hypertension, 26.2 per cent; arteriosclerosis, 24.1 per cent; thyroid, 10 per cent; syphilis, 9.7 per cent; neurologic, 8 per cent; pulmonary, 5.8 per cent; bacterial, 1.6 per cent; congenital, 0.6 per cent; toxic, 0.6 per cent; trauma, 0.1 per cent; and unknown, 8.4 per cent. The combination of two or more factors in one patient presented an interesting field of study as 316 of the 1000 cases were in this group of multiple etiologic factors. King[45] reported the incidence of the etiologic factors in 556 cases of organic heart disease in the Pacific Northwest as follows: Hypertension, 49.4 per cent; arteriosclerosis, 20.3 per cent; rheumatic, 20 per cent; syphilis, 2 per cent; thyroid, 2 per cent; congenital, 0.9 per cent; bacterial, 2 per cent; and unknown, 5.4 per cent. Hedley[46] studied 450 cases of organic heart disease occurring in Washington (D. C.) hospitals and gave the etiologic incidence as follows: Arteriosclerotic-hypertensive, 61.4 per cent; rheumatic, 13.3 per cent; syphilitic, 12 per cent; bacterial, 4.7 per cent; congenital, 2 per cent; thyroid, 1.3 per cent; miscellaneous, 0.6 per cent; and unknown, 4.7 per cent. Moore[47] reported that 77.7 per cent of 297 cases having a cardiovascular abnormality had a hypertensive etiology, while the other 22.3 per cent had a large variety of etiologic factors. Dauer[48] analyzed the mortality rates of organic heart diseases by geographical areas in the United States and noted that in the younger age groups the rate was high in the Atlantic Coast States from Maryland to Massachusetts, in Illinois and Michigan, and in the Mountain States; low rates were noted in the west North Central States and in most of the Southern States; in the older age groups the Northeastern States showed the highest mortality.

5. Etiology

1. *Congenital:* Muir and Brown[49] noted in a review of over 200 cases of congenital heart lesions that digitalis was of little use as its chief indication in these patients, auricular fibrillation, occurred once, and congestive failure was likewise rare. The three major causes of death which took toll of the congenital cardiac were pulmonary tuberculosis, infective endocarditis, and syncope. Leech[50] clinically analyzed 75 cases of congenital heart disease and stated that there was no characteristic type, location, or transmission of systolic murmurs, that diastolic murmurs were infrequent and not dependable, and that many combinations of congenital abnormalities occurred in the absence of any abnormal heart signs whatever.

(a) *Coarctation of the Aorta:* Farris[51] reported two cases, an 11 year old and a 19 year old boy, the hypertension in the youths suggesting the possibility of such a condition. Jacobson[52] described a case in a woman, the diagnosis based on the visible and increased collateral circulation, poor circulation in the lower part of the trunk and the lower extremities, increased blood pressure in the upper part of the body as compared with the lower part, and the positive roentgen examination.

(b) *Septal defects:* Rosedale[53] described a case; a ten year old boy, who, on exercise or fright since the age of four years, had cyanosis and dyspnea due to an interventricular septal defect combined with hypertrophy and dilatation of the pulmonary artery. Hirschboeck[54] reported

a case to illustrate the sequence of paradoxical emboli in the systemic circulation subsequent to venous thrombosis and in association with antecedent pulmonary embolism; a rare instance in which an embolus was found "in transit" through the patent foramen ovale at the time of death. Sprenkel and Stewart[55] related that the presence of significant physical signs in a 16 year old male, the systolic thrill and harsh murmur heard best at the third inner left intercoastal space and unassociated with cyanosis, led to the clinical diagnosis of an interventricular septal defect; a pure culture of Staphylococcus aureus was obtained from the blood ante- and postmortem, and the aortic valve, in addition, was the seat of an old sclerosing lesion upon which an acute bacterial endocarditis was superimposed.

(c) *Persistent Ductus Arteriosus:* Carr, Goodale, and Rockwell[56] reported the occurrence of this lesion in a man who was never cyanotic except on exertion and was able to carry on his work of bookkeeping without difficulty. Hines and Wood[57] described the case of a young female with a patent ductus arteriosus complicated by a bacterial endocarditis and a hemorrhagic nephritis, the endocardial lesions involving the ductus, the pulmonary artery, the pulmonic valve, and the wall of the right ventricle.

(d) *Congenital Complete Heart-Block:* Kinsman and Andrews[58] cited the case of a five year old boy who had attacks of dyspnea and cyanosis since infancy; the only murmur ever heard was systolic in the cycle and always had an element of harshness in it. Levine[59] described a case with a labile ventricular rate in a 12 year old boy, the rate varying with fever, exercise, ocular pressure, and the administration of atropine and epinephrine.

(e) *Others:* Ngai[60] reported a congenital anomaly of the heart of the most extensive type in a 53 day old infant, yet clinically there were remarkably few physical signs and cyanosis occurred only during physical exertion. Wegman and Egbert[61] reported the case of a ten month old infant who developed a marked tachycardia after the seventh month which was diagnosed with the aid of the electrocardiograph as an auricular flutter with a rate of 240/minute; at autopsy a congenital rhabdomyoma invading the conduction system was found.

2. *Rheumatic:* DeGraff and Lingg[62] stated that the average age at the initial infection of rheumatic heart disease in adults was 17 years; at the first appearance of symptoms of cardiac insufficiency, 28 years; at the first appearance of heart failure, 30 years; at death, 33 years; the average patient who was infected at the age of 17 years was free from symptoms and able to carry on ordinary physical activity for 11 years. They[63] analyzed the influence of the type of valvular lesion on the course of rheumatic heart disease from the records of 644 patients who died from this condition, and concluded that the valve affected did not seem to influence the duration of life except in the cases of pulmonic or tricuspid involvment; valvular disease in itself gave no information as to the prognosis in these cases. They[64] studied the influence of auricular fibrillation on the course of rheumatic heart disease in adults and concluded that the fibrillation per se did not determine the prognosis or life expectancy, since it was generally a late manifestation observed in the long standing cases. Davis and Weiss[65] analyzed data on the course of fatal rheumatic heart disease and noted that almost 33 per cent of the patients succumbed as a result of a fulminating course precipitated by factors other than chronic myocardial failure such as acute carditis, embolism, and infections other than rheumatic fever. Bland, White, and Jones[66] stated that the evolution of rheumatic involvement of the mitral valve in young people follows within limits a consistent course; the ultimate development of extensive valvular deformity either with or without actual stenosis of the mitral orifice probably requires a minimum of two years and in most instances a considerably longer period of time, although exceptional cases have been noted. Gross, Kugel, and Epstein[67] described vascular lesions in the main coronary arteries and branches seen in cases of active and inactive rheumatic fever, together with a statistical indication of the frequency of occurrence, the sites of predilection, and a comparison with the findings in normal control cases; several lesions were so peculiar in structure as to suggest the possibility they might be specific for rheumatic fever, but this conclusion cannot be accepted as final without an extensive search for similar lesions in other affections of the myocardium. Gross [68] noted a strikingly high incidence of destructive and inflammatory lesions in the roots of the pulmonary artery and aorta in

rheumatic fever. Yater and Hedley[69] cited a case in which attacks of rheumatic fever recurred for 1½ years, were alleviated by salicylate therapy, and in one attack there was a pericardial effusion; during one attack of polyarthritis, manifestations of septicemia developed suddenly which did not respond to salicylates and blood cultures revealed growths of alpha prime streptococci. Cotton[70] reported the after-histories in a series of 100 cases of rheumatic carditis, all boys with an average age of 11 years, observed over a period of ten years; of 57 cases of mitral disease with a systolic murmur only, 63 per cent living and 32 per cent dead; of 23 cases of mitral stenosis, 35 per cent living and 61 per cent dead; of 14 cases of aortic regurgitation and mitral stenosis 50 per cent living and 43 per cent dead; of the entire 100 cases, 54 per cent living and 40 per cent were dead at the end of ten years. Schwarz and Leader[71] observed 75 cases of so-called "pure" chorea for a period of one to twelve years for evidence of cardiac involvement; it seemed as though the heart was always involved in chorea as in rheumatic fever. Bertrand and Abdala[72] stated that enlargement of the cardiac area, as determined by percussion, was a sign of value in children with atypical forms of rheumatic fever in which the symptoms of cardiac complications appeared late or not at all. Bland and White[73] stated that it is a mistake seriously to limit the activities of any child with inactive rheumatic heart disease on the basis of cardiac murmurs alone, but that the child should be encouraged to lead as active a life as his functional cardiac reserve will allow. Abt[74] described cases of erythema annulare rheumaticum exclusively associated with rheumatic endocarditis; the occurrence of this rash in children suffering from the specific endocarditis was considered to be evidence of either the persistence of an active rheumatic endocarditis or as a sign of reactivation of the disease; a specific exanthem with pale red or bluish red lesions, semicircles or rings, the lesions were found on the chest, over the abdomen, on the sides of the thorax, and on the back, rarely seen on the extremities, never on the face or mucous membranes, never papular but always macular, not associated with itching, edema or hemorrhages, and disappeared without scaling or pigmentation.

3. *Bacterial:* Saphir[75] encountered minute infarcts as the most common and characteristic myocardial lesion in subacute bacterial endocarditis along with numerous other muscle changes, and concluded that there was no specific myocardial lesion in this disease. Von Glahn and Pappenheimer[76] observed cases of subacute bacterial endocarditis for the relationship between it and rheumatic endocarditis, and concluded that the continued activity of the rheumatic manifestations in cases of bacterial endocarditis was attested by the invariable occurrence on the valves of rheumatic verrucae which did not contain bacteria, and by Aschoff bodies in the myocardium in the same percentage of cases as seen in rheumatic carditis. Schwalbe[77] attempted to explain the rapid course of acute endocarditis caused by streptococcus viridans as compared to endocarditis lenta not only on the variation in virulence of the attacking organism, but also on the reduced defensive power and previous impairment of the heart. Tunnicliff and Woolsey[78] reported that 81 per cent of the streptococcus cultures from the blood of patients with subacute bacterial endocarditis belonged to the Viridans group; 84 per cent of these cultures showed signs of "roughness" either morphologically or colonially or both, observations which suggested that the "rough" element of streptococcus cultures may be an essential factor in the production of this endocarditis. Segal[79] noted two cases of auricular flutter and three of auricular fibrillation in 192 cases of bacterial endocarditis; these cases occurred in the course of subacute bacterial endocarditis showing evidence of mitral involvement alone or in combination with aortic valve involvement, but no cases of severe mitral stenosis were noted. Kidd[80] reported a case of instant death in a young adult with bacterial endocarditis due to a mycotic ulceration of the conduction system. Fox[81] described a rapidly fatal case of endocarditis due to hemolytic para-influenza bacillus in a female, important not only because of the unusual organism isolated but also because no portal of entry to the blood stream was found. Okell and Elliott[82], in a study of bacteremia and oral sepsis in reference to the etiology of subacute bacterial endocarditis, reported that within a few moments after the extraction of teeth from obviously septic mouths, a transient streptococcal bacteremia lasting a few minutes was observed in 75 per cent of cases; of 110 persons with septic mouths 10.9 per cent were found to have a strep-

tococcal bacteremia irrespective of any operative interference, observations based on the examination of the blood on a single occasion.

4. *Syphilitic:* Cormia[83] reported an incidence of cardiovascular syphilis of 2.68 per cent in 7,416 autopsies during 35 years, its incidence as a killing disease decreasing but slightly in that period. Maynard, Curran, Rosen, Williamson, and Lingg[84] studied the early diagnosis and clinical course of aortitis in 346 cases of syphilis, of which 41.9 per cent showed positive evidence of cardiovascular syphilis; heart failure occurred only in those patients in whom the involvement had passed beyond the stage of simple aortitis and had developed the late lesions of aortic insufficiency, aneurysm, or narrowing of the ostia of the coronary arteries; their opinion was that the involvement of the aorta began soon after the chancre had appeared. Padgett and Moore[85] stated that properly directed antisyphilitic therapy resulted in a prolongation of life in two-thirds of patients with saccular aortic aneurysm or syphilitic aortic insufficiency, the remaining third coming under observation with an initially bad prognosis and did not survive sufficiently long for proper therapy to be administered. Stratton[86] charted the statistical study of the duration of life in 80 treated and untreated patients with aortic aneurysm and aortic regurgitation as an addition to the original work of Moore in the hope that their inclusion may be of some value in ultimately arriving at a large enough total of similarly studied groups to make the findings conclusive. Norris[87] reported two cases of syphilitic aortitis with sudden death, one in a nine year old girl and the other in a boy of 17 years, with evidence that the lesions were of congenital origin. Love[88] presented a general outline for the treatment of patients suffering from various forms of syphilis of the heart to indicate that such treatment is worth while; even in the suspected presence of syphilitic coronary disease the use of neoarsphenamine was advocated because the prognosis in these cases is extremely grave when untreated, and evidence has been offered to indicate that considerable prolongation of life and symptomatic relief may be obtained with such treatment. Magill[89] described five cases of marked cardiac decompensation which he believed were due to syphilitic myocarditis as all showed extensive scarring and round cell infiltration of the myocardium microscopically. Sohval[90] reported two cases of gumma of the heart, exclusive of aortitis with commissural involvement; unusually situated weird stenotic murmurs, unexplained roentgen shadows at the cardiac margins, and heart block in a patient in whom syphilis was suspected, suggested the possibility of tertiary cardiac syphilis, most likely gumma. Bamber[91] reported a case of syphilitic heart disease showing marked changes in the electrocardiogram following the administration of potassium iodide, which disappeared when the iodide was stopped, only to recur when the iodide was renewed; the graphic changes occurred in the T waves. Sohval[92] reported two rare instances of cardiovascular disease, well scarred granulomas, presumably syphilitic in origin; in a male who had syphilitic aortitis and aortic insufficiency, there was a lesion of cartilaginous hardness in the mitral valve and fibrous septum with destruction of the Bundle of His; a female had a severely scarred aorta, a destructive lesion of the aortic valve, and fibrous thickening of the anterior mitral leaflet as contiguous processes. Blackman[93] described two cases of syphilis of the mitral valve and membranous interventricular septum of the heart occurring together with aortic insufficiency and typical syphilitic lesions of the aortic valve as directly continuous changes.

5. *Other Infections:* Faulkner, Place and Ohler[94] made an electrocardiographic study of 171 cases of scarlet fever during and following the acute infection; abnormal tracings were noted in 11 cases, usually after the thirteenth day from the onset of the scarlet fever; a follow-up study of 600 cases one to three years after the acute infection was made, and it was found that seven patients had developed heart disease in the interval but the type of carditis present was indistinguishable clinically from rheumatic heart disease. Frank[95] reported nine cases of diphtheria in children who had severe cardiac conduction disturbances and eight cases in which the electrocardiograph showed severe impairment of the myocardium; all of the children in whom cardiac conduction was greatly impaired died. Spink[96] described the cardiovascular complications of trichinosis; six of his 18 cases of trichina showed electrocardiographic changes, the earliest deviations being noted in the second week of the disease, but only one of the patients presented clinical evidence of myocardial dam-

age. Porter and Bloom[97] reported a clinical study of the heart in 30 patients with typhoid fever, of which 46.6 per cent showed significant changes of a transient nature in the electrocardiogram; from a clinical point of view the heart presented no significant problem in the treatment of typhoid fever. Dahl[98] reported three cases of tuberculosis of the heart and large arteries; in a girl with acute miliary tuberculosis, there was a tuberculous infiltration extending into the left pulmonary artery; a tubercle containing abundant bacilli was found in the mitral valve with invasion of the adjacent endocardium of the heart of a female; a old male with no signs of a cardiac disturbance and inveterate partially calcified infiltrations in the apex of the left lung, a round well defined tumor the size of half a walnut was found in the wall of the left ventricle, and in the ventricle, corresponding to the tumor, tubercle bacilli were found in a layer of thrombus masses. Barnard[99] described solitary active tuberculous lesions of the internal carotid and coronary arteries showing no evidence of spread from a neighboring focus in a female who had cardiac failure; the origin of the tuberculous arteritis was evidently hematogenous from a calcareous nodule in the lungs. Jones and Rogers[100] presented a small group of patients showing congestive heart failure on the basis of a chronic cardiovascular sclerosis, in whom recompensation could not be obtained until after the removal of a coexisting sinus disease caused by streptococci, which suggested the possible relationship between the focal infection and the cardiac condition.

6. *Thyrotoxic:* Means and Lerman[101] cited two thyrocardiac cases to show that such a patient may be carried along for months under the influence of iodine and then be operated upon without serious consequences. Margolies, Rose, and Wood[102] noted the effect of thyroidectomy on the orthodiagram of the heart in thyroid disease; in uncomplicated hyperthyroidism there was a tendency for hearts of abnormal size, whether large or small, to return toward normal and for hearts within the normal zone to remain so; congestive failure in hyperthyroidism was almost always accompanied by enlargement of the cardiac area but this tended to decrease with postoperative restoration of compensation provided the thyrotoxicosis was also relieved. Rose, Wood, and Margolies[103] studied the effect of thyroidectomy on the electrocardiogram and stated that abnormal tracings occurred with about the same frequency in patients with toxic and non-toxic goiter; marked T-wave changes occurred before and after thyroidectomy in hyperthyroidism but they were of no apparent pattern, their occurrence was unpredictable, were not characteristically larger than normal, did not necessarily become reduced in size when the hyperthyroidism was relieved, and did not always indicate the presence of chronic myocardial disease as the T-wave was often transient. Curschman[104] emphasized that if older persons have a cardiac insufficiency of obscure etiology, particularly if the insufficiency does not respond to digitalis and is accompanied by auricular fibrillation, a thyrogenic origin should be considered.

7. *Myxedema:* Hurxthal[105] presented a case of congestive heart failure the result of myxedema heart; the mechanical embarrassment of the circulation occasioned by the accumulations of effusions were the result of the myxedema and not of the heart failure. Escamilla, Lisser, and Shepardson[106] reported a case of severe hypothyroidism in a female with ascites, cardiac, intestinal and bladder atony, menorrhagia, secondary anemia and associated carotinemia and suggested that the term "internal myxedema" would best describe the findings in this patient; she was observed over a period of 13 months and all the symptoms and signs showed improvement on thyroid therapy except the anemia for which iron was necessary.

8. *Hypertension:* Fahr[107] stated that 55 per cent of the appalling death rate consequent to essential hypertension is due to heart failure and that heart failure of some degree is nearly always present in these cases in which death occurs in uremia, from apoplexy, or cerebral softening. The heart in hypertension shows left ventricular hypertrophy and dilatation with varying degrees of replacement scarring in the myocardium. There is some degree of coronary arteriosclerosis in 90 per cent of the cases; the coronary narrowing is responsible for the scars found in the myocardium; heart failure in a clinical sense does not develop in hypertension until many years, from ten to twelve years, have passed unless the coronary disease accompanying the hypertension becomes very severe or un-

less some other cardiac complication is present; many patients with hypertension live 15 years or more and finally die of one of the other consequences though some degree of heart failure may have been present previously or at the time of death. Rykert and Hepburn[108] demonstrated electrocardiographic abnormalities characteristic of certain cases of arterial hypertension; all of the cases had hypertrophy of the left ventricle caused most often by hypertension and less frequently by aortic valvular disease. Taussig and Remsen[109] reported the case of a two year old colored boy with hypertension, cardiac enlargement, and progressive congestive failure, a cardiac picture so frequently seen in adults. Trubek[110] stated that the presence of hypertension itself does not contraindicate any surgical procedure, but that the degree of structural changes with which it may be associated determines the extent to which surgery may be performed.

9. *Pulmonary:* McGinn and White[111] emphasized the clinical recognition of acute cor pulmonale secondary to pulmonary embolism; the symptoms were variable, but predominating at first were those of shock, followed by the reaction to the infarct itself. It the state of shock from extensive pulmonary embolism was not too great, or after it had cleared, there were signs indicative of the secondary effect of the pulmonary embolism. Clark and Graef[112] reported a patient with a cardiac diagnosis of unknown type with mitral insufficiency and stenosis with sinus tachycardia, Class 3, who had symptoms for seven years and decompensated one month before her hospital entry; gross examination at autopsy was not definite, but microscopy revealed it to be a case of Bilharziasis, schistosomiasis mansoni, a specific pulmonary arteritis which caused right ventricular hypertrophy, congestive failure and death. White[113] stated that the clinical recognition of the acute cor pulmonale—dilatation of the pulmonary artery and right heart chambers with or without failure—was an important step in the early differentiation between massive pulmonary embolism and coronary thrombosis and other conditions; the recent circumstances such as a surgical operation, accident, or phlebitis, with the abrupt onset, the increased prominence and pulsation noted by inspection and palpation in the region of the second and third intercostal spaces just to the left of the sternum with the friction rub and systolic murmur over the same area, the cyanosis, the roentgen ray and the electrocardiogram helped make the diagnosis. Paul[114] stated that although the mortality rate among individuals with bronchial asthma is higher than among others of the same age groups, this cannot be attributed to cardiovascular disease as no evidence has been presented to show that asthma is primarily responsible for structural changes in the heart.

10. *Coronary:* Brown,[115] in a study of the relationship of coronary arteriosclerosis to auricular fibrillation with especial reference to the term arteriosclerotic heart disease, reported that significant disease of the coronary arteries although fairly common among those with hypertension was not the sole factor in the development of permanent auricular filbrillation in such cases. Nemet and Gross[116] noted that patients who had hypertrophied hearts with coronary artery disease were more likely to develop congestive heart failure than those with non-hypertrophied hearts. Smith, Paul, and Rathe[117] analyzed the clinical course of 420 cases of coronary artery disease divided into five groups on the basis of the initial or the dominant initial symptom of dyspnea, paroxysmal dyspnea, severe anginal pain, angina of effort, or pain of an indefinite nature; the intimate relation of these clinical manifestations was one of the outstanding features in the progression of the cardiac disability, and indicated that the symptoms were merely different expressions of the same basic factor, a deficiency of the coronary circulation. Saphir, Priest, Hamburger, and Katz[118] evaluated the respective clinical pictures based on the anatomical findings in coronary thrombosis and stated that both coronaries were involved in all hearts examined and that at least two branches of the coronary arteries supplying the infarcted areas were involved; sudden death following the occlusion of a single main branch was not encountered. Wilhelmy and Helwig[119] analyzed 88 cases of coronary disease observed in 1000 necropsies and stated that 43 per cent had no history of pain, and no symptoms referable to the heart were elicited in 14.7 per cent. Stewart, Birchwood, and Wells[120] examined a small series of hearts to determine the relation between the size of the lumen of the coronary arteries at the site of atherosclerotic plaques, as seen in the col-

lapsed artery in the usual postmorten examination, and the true size of the lumen when the artery was distended by the usual blood pressure; they concluded that apparently the atherosclerotic plaques in the coronary arteries do not necessarily protrude into the lumen during life and the apparent narrowings seen in the dead body may not have existed during life. Katz and Bohning[121] stated that after the exclusion of serial four-lead electrocardiograms obtained in patients suffering from acute infectious processes, moribund patients, and those due to large doses of digitalis, they determined whether the coronary insufficiency was (a) an acute transitory insufficiency as angina pectoris, nocturnal dyspnea, cardiac asthma, or its equivalent; (b) subacute coronary insufficiency as recent occlusion, thrombotic or arteriosclerotic, with myocardial infarction; (c) chronic non-progressive, or (d) chronic progressive coronary insufficiency. Leary[122] suggested coronary spasm as a possible factor in producing sudden death where the lumen was adequate and unobstructed in an elastic coronary artery. Fernando[123] reported the occurrence of coronary occlusion in a patient 24 years of age whose mother died of the same cause when 45 years old. Cooley[124] reported the case of a 35 year old male who recovered from a coronary thrombosis and enjoyed 12 years of active life with considerable physical exertion before he succumbed to a second attack. Master[125] reported the improved prognosis of 75 patients in 85 attacks of coronary thrombosis treated by prolonged rest in bed and a low calory diet; the patients returned to their usual routine life or work following at least 62.5 per cent of the attacks and resumed light to moderate activity in at least 14 per cent. Cooksey,[126] in a follow-up study of acute coronary thrombosis with especial reference to the prognosis in 53 cases, reported that the mortality was 39.6 per cent; of the 32 surviving patients, 78 per cent were restored to their previous occupation with one patient living 13 years and ten patients living six years after the onset of the infarction. Smith and Sauls[127] reported eight cases of the less severe and atypical types of coronary thrombosis to indicate that the immediate mortality in this condition may be materially reduced by the early diagnosis and treatment of patients who fail to manifest the usual signs and symptoms of this disease. Horine and Weiss[128] reported that patients who had normal sized hearts at the time they experienced a coronary thrombosis did not develop roentgenologic evidence of cardiac enlargment although observed from five months to almost ten years. Applebaum and Nicolson[129] analyzed the pathological anatomy of occlusive diseases of the coronary arteries; in the main or arteriosclerotic group the heart weights were above 500 grams in 50 per cent of the cases and in many of these there was a clinical record of hypertension or evidence of hypertension prior to the occurrence of the coronary occlusion. Wood and Hedley[130] reported a distinct variation in the seasonal incidence of acute coronary occlusion in Philadelphia, the majority of the cases occurring in autumn and winter. Holst[131] stated that many of the symptoms of myocardial infarction are so transitory that they can be confirmed by examination at certain times or by repeated examinations. Williams[132] cited a case of coronary thrombosis in which the transitory reduplication of the second tricuspid sound was the sole sign after a fainting attack. Sprague and Orgain[133] stated that cases of acute coronary thrombosis with closure limited to a single coronary artery or branch were relatively rare at the autopsy table. Knauer[134] reported a case of transient complete heart-block in acute coronary thrombosis studied with serial electrocardiograms from the actual onset to and after clinical recovery. Bickel, Nozer, and Sciclounoff[135] suggested that the blood sedimentation test in myocardial infarction may prove a useful adjunct to the clinical signs and electrocardiogram in deciding how soon after the thrombosis the patient may return to activity. Grant and Miller[136] reported a case of primary atheroma of the left coronary artery with the resultant myocardial fibrosis leading to insufficiency and death in a 25 year old male. Hoseason[137] cited the occurrence of sudden death in a 36 year old male due to an embolism of the right coronary artery which originated from a small thrombus loosely attached to an ulcerated area over a calcified nodule on the posterior cusp of the aortic valve. Durant[138] described the occurrence of coronary air embolism complicating the attempted induction of artificial pneumothorax for a unilateral tuberculous process with cavitation in a young female. Medlar[139] reported cardiac infarction in a 40 year old male with pul-

monary tuberculosis whose death was entirely unexpected, the cause being a caseous tuberculous embolus within a branch of the left coronary artery.

11. *Miscellaneous.* (a) *Pregnancy:* Schuman[140] reported 2.3 per cent of organic heart disease with two deaths in 918 deliveries; 11 had spontaneous or low forceps deliveries, one version and extraction, six Cesarean section and sterilization with one death, four had abdominal hysterectomy and sterilization, two had induced abortions, and one was undelivered who died. Fitzgerald[141] reported a series of 126 women with severely damaged hearts under observation and strict control during 192 pregnancies; no patient died during pregnancy or labor and no patient was delivered by Cesarean section because of the heart condition, and the most important factor in their care was the prevention of heart failure; 107 had mitral disease, 12 aortic disease, and seven had combined mitral and aortic lesions. Reis and Frankenthal[142] stated that the rheumatic heart disease was stationary rather than progressive in many women who went through repeated pregnancies with no apparent additional disturbances to the circulatory system. Bramwell[143] forbade pregnancy in all patients with established auricular fibrillation and in those known to have suffered from congestive heart failure; when patients in this group were seen in the early months of pregnancy the uterus was emptied, but no pregnancy was interfered with, either early or late, until every effort had been made to relieve the heart failure by medical treatment. Hanley and Anderson[144] reported 53 cases of pregnancy and heart disease; spontaneous delivery occurred in 68 per cent, forceps in 5.6 per cent, version and extraction in 5.6 per cent, and Cesarean section in 18 per cent. Daichman and Kornfield[145] stated that in a ten year period of 22,100 women delivered 205 had definite heart disease; 65 had spontaneous deliveries, 93 had forceps deliveries, six version and extraction, four abdominal hysterotomy and sterilization, eight cesarean section, without sterilization, 22 cesareans with sterilization, and three died undelivered. The mortality was 4.87 per cent, and contrary to the general impression that cardiac patients have short labors, 82 per cent of the primiparas had an average labor of 20.5 hours. Nelson and Eades[146] were unable to demonstrate in 495 patients that cardiacs have any shorter or easier labor than the normal woman; the mortality was 4.6 per cent, and the pregnant cardiac patient was treated as a medical problem and secondarily as an obstetrical problem.

(b) *Trauma:* Beck[147] stated that contusions or nonpenetrating wounds of the heart rarely destroy life as the heart can tolerate an enormous amount of trauma; three possible sequences may occur, the heart ruptures, or the heart fails without rupture, or recovery takes place. Bright and Beck[148] reported that after the diagnosis of a cardiac contusion has been made the symptoms may disappear hours or days after the accident and the patient remain well, the symptoms may persist for years and the patient remain well but be accentuated by exercise, the heart may fail hours or days after the accident, or the contusion may soften and cardiac rupture occur any time during the first month. Beck[149] stated that the most common cause of acute cardiac compression is intrapericardial hemorrhage recognized by the triad of falling arterial pressure, rising venous pressure, and a small quiet heart. Fair[150] reported the case of a patient who forced a large-sized needle through the chest wall into the wall of the right ventricle of the heart, and operation within three hours of the act found the needle inaccessible in the heart muscle due to the retraction by systolic contractions; the patient recovered although the course was complicated by a suppurative pericarditis and an empyema, the needle remaining in the right ventricular wall. Goldberger and Clark[151] described the electrocardiographic and roentgenographic studies of the migration of a needle into the heart through the chest wall and the surgical removal; the pain distribution was that of coronary artery disease and the site of the needle puncture in the left ventricle was close to the proximal portion of the left coronary artery; the patient died from cardiac tamponade due to secondary hemorrhage into the pericardial sac. Benet and Spivey[152] reported the case of a boy knifed in the anterior chest wall, operated on 2½ hours later, and the wound in the anterior wall of the right ventricle was repaired with recovery from a complicating pleural suppuration and rib resection; the boy returned to work with no resultant cardiac embarrassment or clinical signs of pericardial adhesions. Koucky and Milles[153] described the case of a boy with a stab-wound of the heart on

whom surgery was performed without anesthesia or anything more than the most cursory attempts at sterility necessitated by the extreme state of the patient, and resulted in ultimate and complete recovery; a purulent pericarditis followed by a polyserositis occurred but there was little obliteration of the pericardial sac.

(c) *Arteriovenous Aneurysm:* McGuire[154] stated that the establishment of a large arteriovenous communication between the popliteal artery and vein in a young man was accompanied by a clinical picture simulating myocardial insufficiency due to aortic valvular insufficiency, and operative extirpation of the aneurysm caused a disappearance of the symptoms and findings. LaPlace[155] reported that among other changes the size of the heart was reduced 45 per cent following surgical closure of a traumatic arteriovenous aneurysm in his cases Kisthinos[156] stated that the rapidity of the appearance of cardiac disorders was in direct proportion to the size and caliber of the communicating vessels in arteriovenous aneurysms.

(d) *Uterine Myoma:* Fetter and Schnabel[157] reported that no indication was found of any such clinical entity as the "myoma heart" in 25 patients with uterine myoma; the most common concomitant in these cases was hypertensive heart disease.

(e) *Surgery and Anesthesia:* Hickman, Livingstone, and Davies[158] stated that since there were only six deaths due to cardiac disease and two due to pulmonary disease related to surgery and anesthesia in 336 cardiac patients who underwent 345 operations, the mortality of 2 per cent indicated that as a group patients with cardiac disease are fairly good surgical risks; the most serious cardiac conditions with which the surgeon has to deal are angina pectoris, coronary occlusion, decompensation, hypertension, and thyrotoxic heart disease. Sise[159] reported that a nice choice between the anesthetic to be used for thyrocardiacs is less important than the conduct of the anesthesia which should include the avoidance of anoxemia and obstruction, and the use of liberal premedication, minimal rebreathing, and nicely adjusted depths of anesthesia.

6. PATHOLOGY

1. *Myocardial:* Simon and Wolpaw[160] reported a case of progressive and rapid myocardial failure without apparent cause in a 23 year old male who died from acute, subacute, and chronic isolated myocarditis of unknown etiology. Sigler and Schneider[161] cited two cases of left ventricuar aneurysm, one in a 33 year old male whose heart was the seat of a diffuse coronary sclerosis and occlusive processes with myocardial fibrosis; the clinical criteria for the diagnosis of cardiac aneurysm included a history of coronary occlusion, an abnormal area of cardiac dullness over which was heard a weak first heart tone, possibly an associated gallop rhythm, and a bulging cardiac shadow following the heart displacements on the roentgenogram. Niehaus[162] reported a typical obstruction of a coronary artery due to pressure from a calcified nodule in the myocardium. Shelbourne[163] described the signs, symptoms, and histologic appearance of a primary sarcoma of the heart in a 24 year old male who had a rapid accumulation of fluid in the pericardial sac accompanied by signs of acute cardiac decompensation. Stevenson and Turner[164] reported a case of sudden death due to the rupture of a papillary muscle in the heart; usually this is the result of coronary occlusion and infarction of the myocardium and the condition may be suspected clinically by the sudden onset of a loud whistling to-and-fro murmur occurring in association with the signs and symptoms of coronary occlusion.

2. *Endocardial and Valvular:* Held, Goldbloom, and Lieberson[165] indicated the diagnostic and prognostic importance of differentiating the "tight," non-regurgitant or fatal type of mitral stenosis, characterized by the pulmonary symptoms of persistent dyspnea and blood spitting, from the more benign form of double mitral disease of stenosis and insufficiency. Marvin and Sullivan[166] reported clinical observations upon syncope and sudden death in relation to aortic stenosis; nine patients died with extreme suddenness when they appeared to be in their usual health, and five were subject to sudden and unexpected loss of consciousness associated with slight to strenuous physical exertion. Clements[167] described a case of isolated tricuspid stenosis of probable rheumatic origin in which there was an extreme degree of narrowing of the tricuspid ostium with no involvement of the other valves, no history of rheumatic fever, a marked clinical similarity to mitral stenosis with Aschoff bodies in the myocardium and a slight enlargement of

the right auricle in the presence of the extreme stenosis. Kaplan and Hollingsworth[168] reported a case of pedunculated thrombus in the left auricle clinically simulating mitral stenosis in a 38 year old male who had auricular fibrillation.

3. *Pericardial:* Bunch[169] stated that suppurative pericarditis is essentially a disease of children and young adults, and although marked by characteristic physical and roentgen findings, accumulating evidence had indicated that most cases are not recognized clinically because the condition is not suspected and not looked for. Shipley and Winslow[170] reported five cases of purulent pericarditis treated by pericardiotomy and stated that troublesome postoperative adhesive pericarditis does not occur as often as presumed; the three chief factors that govern the prognosis are the time of operation, the type of organism, and the original condition of which the pyopericardium is a complication. Moore[171] advocated a left-sided posterior approach to the pericardium as the procedure of choice for drainage of suppurative pericarditis when this infection follows a left-sided empyema. Burwell and Flickinger[172] cited a case of obstructing pericarditis in a boy who, at operation, had a greatly thickened and inextensible pericardium with several encapsulated accumulations of purulent fluid amounting to about 25cc. from which a pure culture of Staphylococcus aureus was obtained; the chief mechanism underlying the symptoms and signs in this concrete cordis was an increased venous pressure and a decreased cardiac output, and the removal of a portion of the pericardium was followed by a fall in venous pressure, a rise in the cardiac output, and an increase in the cardiac pulsation. White[173] analyzed the literature and 15 personal cases of chronic constrictive pericarditis (Pick's Disease) treated by pericardial resection; the leading clues were the result of "inflow stasis," namely, the insiduous onset of dropsy in a young person, preponderant liver enlargement and ascites, the increased prominence of the jugular veins, a normal or relatively normal heart in the presence of dropsy without nephritis, and a low blood and pulse pressure with a paradoxical pulse; other important clues were roentgen evidence as poor cardiac pulsation, calcification, or chronic pleuritis, and the electrocardiographic abnormalities as low voltage or "coronary T-waves" in chronic disease in youth. Winkelbauer and Schur[174] described eight cases of adherent pericarditis treated surgically from which they observed that some of the anatomic changes were compensated by an improvement of the cardiac function and that the condition of the myocardium was the decisive factor for the extent of operation. Steuer and Higley[175] reported a case of a primary sarcoma of the pericardium completely surrounding and compressing the heart but not invading it. Barsoun[176] described a case of cardiac insufficiency with enlargement of the heart to four times the normal size due to marked dilatation in the absence of a pericardial sac.

4. *Vascular:* Weiss[177] described the clinical course of spontaneous dissecting aneurysm of the aorta and emphasized the occurrence of the initial syncope, the location and the character of the pain, the appearance of cardiac murmurs, the manifestations of peripheral vascular occlusions, and the occurrence of leucocytosis and fever. Thompson, Souttar, and Howells[178] treated a saccular aneurysm of the thoracic aorta in a 51 year old male by wiring with Colt's apparatus; the introduction of gold wire wisps into the aneurysmal sac produced coagulation within it, prevented its rupture, and enabled the patient to continue an active life for 3½ years. Behrend and Boles[179] described a case of aneurysm of the thoracic aorta with surgical intervention because of the uncertainty of diagnosis and associated adhesive pericarditis; the aneurysmal sac was accidentally opened and successfully closed at operation, and the patient survived for ten months with apparent benefit. Hardaway and Green[180] reported two cases of intrapericardial rupture of the aorta, one in a 19 year old male who developed very severe cardiac pain during a tennis tournament and died four days later after a sudden exertion with marked cyanosis of the hands and face outstanding; the other was a 54 year old male who was seized with severe cardiac pain while defrosting a refrigerator, had marked cyanosis of the hands and face and died suddenly six days later. Gough[181] described a case of thrombosis of the entire aorta in a woman aged twenty, the lesion apparently one of syphilitic aortitis accompanied by very severe atheroma but no gross aneurysm formation. McNaught and Dock[182] reported a case of sudden death from a spontaneous rupture of the

pulmonary artery in a 44 year old male who had suffered periods of marked cardiac decompensation for 16 years.

7. FUNCTIONAL DISORDERS

1. *Congestive Failure, Including the Use of Digitalis and Diuretics:* Harrison[183] stated that the precipitating factors in heart failure are infections, especially respiratory, exertion, cough, pregnancy, obesity, anemia, tachycardia, changes in rhythm, emotional disturbances, and prolonged mental strain. Cassidy[184] emphasized that in the aftercare of patients who have had congestive heart failure complete rest in bed should be enjoined for two or three months after all evidences of decompensation have disappeared. Carter[185] stated that digitalis is of no value in controlling premature beats, paroxysmal tachycardia, or the tachycardia of infections, and contraindicated in the so-called post-operative surgical shock except when definite signs of cardiac failure appear. Robey[186] reported two cases of visual disturbances due to digitalis; enough of the drug could be taken prior to the onset of white vision to produce a considerable effect upon the heart and this effect could be maintained by small doses which were then omitted when the visual disturbances occurred. Cohn and Lewis[187] stated that the giving of digitalis did not seem to influence the course of events in lobar pneumonia since the outcome depended on the severity of the infection. Arnold, Middleton, and Chen[188] reported that the action of thevetin, a cardiac glucoside, was more prompt but less sustained than digitalis; clinical application was limited because of the irritant qualities of thevetin. Carr and Mayer[189] stated that scillonin, a derivative of squill, produced the same effects as digitalis in the treatment of cardiac decompensation but the toxic manifestations on nausea and cardiac irregularities when they did appear were of a much severer nature than those of digitalis intoxication. Ginsberg, Stoland, and Loy[190] suggested that the sustained increase in the coronary flow in the intact experimental animal and the absence of undesirable physiologic reactions following the intravenous administration of hypertonic solutions of dextrose may account for the many favorable clinical results. Podolsky[191] stated that dextrose therapy was more likely to succeed in the early stages of cardiac insufficiency before gross myocardial changes have occurred. Nichol[192] reported that in a group of 20 patients with heart disease 50% improved with the use of insulin in association with a high carbohydrate diet and extra feedings of glucose. Smith, Rathe, and Paul[193] indicated that the preparations of theophylline have a marked dilating action on the coroiary vessels with distinct therapeutic value in the treatment of coronary artery disease regardless of whether the cardiac disability was expressed by congestive failure, paroxysmal dyspnea, angina of effort, or occlusion of the coronary arteries. Tziwanopoulous[194] emphasized that the administration of salyrgan should be preceded by thorough digitalization. Hug[195] stated that particular caution should be used in the administration of salyrgan even though it is well tolerated by young and old. Friedenson[196] reported the results of intensive ambulatory treatment with diuretic measures in advanced cardiac insufficiency where the chief problem was the prevention and control of edema which no longer yielded to digitalis alone; it was not claimed that the improvement with diuretic measures rendered the patient less liable to sudden death or prolonged life, it only made their existence more tolerable. Crawford and McDaniel[197] observed that a combination of an organic mercurial compound with theophylline (originally introduced as novurit but now called mercupurin) gave satisfactory increases in the volume of urine without toxic effects. Parade[198] reported a case in which a severe tachycardia, followed by vomiting, debility and collapse, occurred after the intravenous injection of salyrgan. Bloom and Cashon[199] stated that therapeutic doses of salyrgan have no effect on the blood pressure, the pulse or the electrocardiogram. Friedman, Resnik, Calhoun, and Harrison[200] noted that diuretic drugs, even when administered to patients with minimal edema, often produce marked relief from dyspnea. Fulton and Bryan[201] compared the effectiveness of mercurial diuretics with and without theophylline from which they concluded that one diuretic could be more effective than another in a given individual as better results may be obtained with mercupurin than with salyrgan and *vice versa*. Steuer and Wolpaw[202] reported good diuretic results with 2cc. doses of mercupurin

intravenously in congestive heart failure after the patients had been on cardiac routine for several days.

2. *Angina Pectoris:* Shambaugh[203] presented evidence to show that in the dog cardiac pain produced by the mechanical constriction of the coronary vessels did not cause a significant rise in blood pressure, yet the pain response could be precipitated by suddenly raising the blood pressure in the presence of subminimal constriction of the coronary vessels. Boas[204] stated that the syndrome of angina pectoris occurred in patients with calcareous aortic stenosis and appeared to be caused, not by disease of the coronary arteries, but by narrowing of the aortic valvular opening itself which impaired the blood supply to the coronary arteries simultaneously. Beach[205] reported constitutional diseases, an exopthalmic goiter, a pernicious anemia, a diabetic with insulin shock, and myxedema, all associated with anginal symptoms from which he concluded that the paroxysms occurred when the available energy did not equal the demands made on the myocardium. Sommer[206] stated that in adequate dosage the so-called cardiac harmone preparations in pure form, musculadenosine phosphoric acid, gave good service in the physiologic therapy of angina pectoris. Wolffe[207] reported that of 280 cases of angina pectoris treated with the insulin-free pancreatic extract, "Tissue Extract No. 568" (Desympatone), about 190 obtained complete or partial relief. Proger, Minnich, and Magendantz[208] studied the circulatory response to exercise in patients with angina pectoris and noted: 1. Failure of the heart rate to increase normally during exercise; 2. Development of extrasystoles shortly before the onset of pain and its disappearance shortly after the cessation of exercise; 3. A thin, thready, rapid, barely palpable pulse during exercise; and 4. Primary respiratory distress with a rapid pulse characteristic of cardiac weakness. Wedd and Smith[209] reported that 50% of 166 cases of effort angina had hypertension which did not alter the prognosis; about 33% died suddenly and over 50% died of coronary occlusion; the average duration of life was 5.8 years, greater than usually anticipated, and while the prognosis in the individual case must always be uncertain, when viewed in the light of its comparatively long duration and the late age of onset and death as compared with the normal life expectancy, the anginal syndrome appears less grave and does not stand out as a serious complication of arteriosclerotic heart disease with which it is fresuently associated.

3. ARRYTHMIAS, ETC.

(a) *Paroxysmal Tachycardia, Etc.:* Feher[210] reported two especially severe cases of paroxysmal tachycardia in which the continuous oral administration of large doses of quinidine, 2.5 to 4.5 grams daily, proved effective without any ill results. Stenhouse[211] controlled an attack of paroxysmal tachycardia in a 14 year old boy with large subcutaneous doses of acetylcholine. Farr and Wegman[212] reported a case of extreme tachycardia of unknown etiology in a newborn, the course of the disorder not obviously influenced by treatment. Aschenbrenner[213] reported a case of mitral stenosis in a woman, who, in a severe attack of tachycardia, was given large doses of digitalis, seven grains, intravenously until the tachycardia ceased. Thompson and Levine[214] observed 35 patients with systolic gallop rhythm over a period of 11 years and commented that the rarity of cardiac enlargement and physical incapacitation, the slight degree of arterial hypertension in those that had it, and the complete absence of congestive signs, all point to its benignity. Bramwell[215] stated that presystolic gallop rhythm is a sign of great clinical significance, occurring most frequently in patients with hypertension, advanced coronary disease, or acute inflammatory lesions of the heart, as it is an extremely grave prognostic sign, very few patients living more than two years after the presystolic gallop develops.

(b) *Auricular Fibrillation and Flutter:* Ferreira[216] discussed a group of patients in which the electrogram revealed a disorder of the auricular mechanism but which was neither true fibrillation nor true flutter; these cases responded well to the administration of digitalis followed by quinidine, the subjective symptoms as well as the graphic abnormalities disappearing. Nahum and Hoff[217] reported that acetyl-B-methylcholin chloride, also known as Mecholin, rapidly converted auricular flutter into fibrillation. Sayid[218] observed palpitation and dyspnea in cases of amebic dysentery after emetine injections and reported two cases of auricular fibrillation to show that the depressant action of eme-

tine on the cardiac muscle is far from negligible. Arenberg[219] reported a case of paroxysmal auricular flutter with 1:1 auriculo-ventricular ratio in a male while digitalized for congestive failure; the tachycardia of 250/minute lasted two hours and was relieved by morphine.

(c) *Quinidine Therapy:* Kohn and Levine[220] evaluated the use of quinidine in persistent auricular fibrillation and stated that the question of reversion to normal rhythm was not the only criterion necessary to judge the success of the treatment; from an etiological standpoint, rheumatic valvular disease was most resistant and non-valvular fibrillation responded more readily, but the clinical condition of the patient proved to be no guide in avoiding disastrous results. Carter and Traut[221] demonstrated the value of the combined use of quinidine and strychnin in the treatment of premature contractions which precipitated congestive failure.

(d) *Heart-Block:* Yater and Cornell[222] reported a case of complete heart-block due to calcareous lesions involving the Bundle of His. Preston[223] cited the case of a young female, apparently healthy, who had several repeated fainting spells and her apex rate was 28/min.; after the diagnosis of complete heart-block was established by the electrocardiogram, the rhythm became normal 14 days later and remained so. Wolferth and Margolies[224] stated that a split systolic apex impulse was recorded in some, but not in all, cases of bundle-branch block, but it also occurred in the absence of bundle-branch block. Blaisdell[225] described the occurrence of transient heart-block in a diabetic patient during an attack of acute coronary thrombosis with recovery. Salcedo-Salgar and White[226] indicated that a marked discrepancy exists between the occurrence of heart-block, auriculo-ventricular and intraventricular, and the clinical evidence of coronary disease, so that even in the absence of associated angina pectoris, coronary disease or coronary thrombosis, the prognosis of the heart-block may be poor. Wood, Jeffers, and Wolferth,[227] in a follow-up study of 64 patients with a right bundle-branch conduction defect, stated that when this type of electrocardiogram is found in a patient with no other evidence of heart disease, it is not necessarily an ominous prognostic sign; its presence per se in a group of patients does not seem to add materially to the gravity of their prognosis. Faulkner[228] reported an extreme degree of partial heart-block in which the P-R interval exceeded the R-R interval, and on one occasion the P-R interval reached 0.80 second as compared with the normal interval of 0.20 second or less; in spite of the extraordinary delay in conduction the sinus rate was usually normal or increased. Strauss[229] reported a cardiac arrhythmia which showed sino-auricular block of varying degrees, almost complete A-V dissociation without primary A-V block, nodal escapement, aberrant conduction, and sinus arrythmia with a shifting pacemaker. Feldman[230] described a sinoauricular block and ventricular escapes in a case of syphilitic heart disease with bundle-branch block with a spontaneous return to sinus rhythm four months later.

8. SPECIAL TREATMENT

1. *A New Blood Supply to the Heart By Operation:* Robertson[231] reestablished the cardiac circulation on dogs during experimental progressive coronary occlusion, the myocardial nutrition distinctly depending on the vessels contained in the pericardial adhesions. Beck and Tichy[232] experimentally produced a collateral circulation to the heart by operation, and when this was present, almost total occlusion of both coronary arteries was effected with recovery; they believed that their experiments have demonstrated that the collateral vascular bed can become the major source of blood supply to the heart. Moritz and Beck[233] stated that the data, chiefly pathological, derived from their study of 94 cases of major coronary occlusion would indicate that there was a period after the first coronary occlusion in the lives of 43 individuals when the production of an extracardiac coronary circulation might have been feasible and beneficial. Beck,[234] on the basis of his experimental work, gave a collateral vascular bed to a patient with coronary sclerosis on February 13, 1935; seven months after operation the patient worked, had no pain, and claimed to be cured. By September, 1935, seven such cases had been operated on, but a sufficiently long interval had not elapsed to comment on the other cases, and Beck especially emphasized the point that this work was still in the experimental stage.

2. *Total Ablation of the Normal Thyroid Gland:* Blumgart, Berlin, Davis, Riseman, and Weinstein[235] stated that the beneficial results achieved by this procedure in 75 patients with

congestive heart failure and angina pectoris warrants its further application; the precautions to be exercised in the selection of cases, the preoperative, operative, and postoperative management and the treatment of the various complications must be rigidly adhered to for the best results. Blumgart, Riseman, Davis, and Weinstein[236] demonstrated the value of this procedure in the treatment of patients with arteriosclerotic heart disease as ten patients who would otherwise be forced to spend the greater part of their lives in bed were enabled to return to renumerative occupations or housework. Levine and Eppinger[237] reported that in 12 cases of severe intractable heart disease treated by total ablation, some benefit was obtained, but the state of the lesions was so far advanced that in most cases the improvement did not last an appreciable length of time. Hertzler[238] editorially commented that these operations have resulted in the demise of two very tenacious fetishes, that the basal metabolic rate does not tell about what the thyroid gland is doing to the individual and that there is no limit to the liberties the surgeon may take in the removal of the gland. Berlin[239] summarized his surgical experience with total ablation and stated that 70% to 90% of the patients with either angina pectoris or congestive heart failure have shown marked or moderate improvement following the operation but extreme care must be exercised in the selection of the patients. A recent editorial[240] stated that the economic and social status of the individual constitute an important element in the selection of patients for this operation, that there is no evidence as yet to show that the operation prolongs the life of a patient with angina pectoris and therefore cannot be recommended with this in view, and that it is very important that the general application of this operation by those unfamiliar with the selection of patients or the surgical technic is utterly inadvisable.

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THE ANTIDOTAL ACTION OF POTASSIUM PERMANGANATE

Robert A. Hatcher, New York (*Journal A. M. A.*, Aug. 17, 1935), asserts that potassium permanganate has a distinct but limited field of usefulness in the treatment of cases of poisoning. Fairly dilute solutions are irritant and concentrated solutions are caustic, while a large dose may cause death. Among the more common alkaloids that give rise to fatal poisoning after their oral administration and for which potassium permanganate may be useful are aconitine, amidopyrine, antipyrine, morphine and strychnine. To these may be added picrotoxin and probably pictrotoxin-like substances (wild parsnip). Potassium permanganate may be used for the destruction of hydrocyanic acid and of potassium or sodium cyanide in the stomach, but only in an alkaline solution. The reaction of potassium permanganate with different poisons varies widely, depending on whether they are present in acid, neutral or alkaline solutions. It should not be depended on to destroy all the poison, and its use should be followed by evacuation of the stomach. Potassium permanganate may be administered orally in concentration varying from 1:2,000 to 1:5,000, depending on the dose required; and 1:5,000 may be used for washing the stomach. Potassium permanganate is useless in cases of poisoning by atropine, cocaine or yellow phosphorus in substance, or by any one of the greater number of the hypnotics; it may be useful in washing the stomach after poisoning by alurate, dial and possibly some others; not after barbital, phenobarbital, amytal, neonal, sulphonal or hydrated chloral poisoning. It may be used for washing the stomach in cases of poisoning by phenol or creosote, but it cannot be administered safely in sufficient amounts to decompose an otherwise fatal dose of either. The dose of potassium permanganate and the concentration of the solution should be governed by the nature and the quantity of the substance which it is designed to decompose, and with reference to the other contents of the stomach. Potassium permanganate decomposes protein much less rapidly than it decomposes certain poisons, tannin (from tea and coffee) almost instantly, diluted alcohol within a few minutes and sugar (sucrose) very slowly. There is no justification for the intravenous, subcutaneous or intramuscular injection of potassium permanganate for the destruction of any poison in the circulation.

DINITROPHENOL IN TREATMENT OF OBESITY

M. L. Tainter, A. B. Stockton and W. C. Cutting, San Francisco (*Journal A. M. A.*, Aug. 3, 1935), and their collaborators treated 170 unselected obese patients with sodium dinitrophenol (2-4), administered by mouth for an average of eighty-eight days each, in an average daily dose of 0.34 Gm. The average increase in metabolic rate was about 11 per cent for each 0.1 Gm. daily dose. The average loss of body weight was 17.1 pounds for each patient, with an average rate of loss of 1.4 pounds weekly. Patients resistant to dietary or thyroid measures lost weight as well as those previously untreated, but patients who had resisted combined dietary and thyroid therapy lost less rapidly on dinitrophenol than the other groups. The main symptoms of therapeutically effective doses of dinitrophenol were those of extra heat production; namely, sweating, flushed skin, concentrated urine, and sensations of warmth. These symptoms could be controlled to some extent by building up the dosage gradually to the therapeutic level and by ensuring adequate fluid intake. No evidence was obtained in these patients that dinitrophenol affected the blood cells, as shown by blood counts and clinical observations. Side actions, consisting of skin rashes or peripheral nerve changes, were observed in about one-fourth of the patients receiving high doses, or in about one-seventh of the entire series. These side actions may be largely avoided by stopping medication promptly on the first appearance of any of these changes. Dinitrophenol is a highly effective drug for increasing the metabolic rate and reducing excessive body weight. Medication with this drug is probably indicated mainly in those cases in which other potentially less toxic means of treatment cannot be successfully applied. For those obese patients who are resistant or unsuited to other therapy, dinitrophenol is a potent and valuable therapeutic agent.

OBSERVATIONS ON TREATMENT OF ACNE VULGARIS

According to Jeffrey C. Michael, Houston, Texas (*Journal A. M. A.*, Aug. 3, 1935), acne vulgaris is a syndrome the cause of which is a complex of various interacting factors. In juvenile patients the physiologic activity of the gonads appears to be the most important factor. In older patients minor functional and organic disorders apparently but not indisputably play a definite role in the causation. The recent tendency to depend less on roentgen therapy and more on general and local measures should be encouraged. While the roentgen ray is the most certain means of eradication of the lesions, recurrences are too frequent to make this treatment entirely satisfactory. In juvenile patients recurrences are especially frequent and for this reason it is believed that the roentgen ray should not be used except under unusual circumstances. For older patients, especially those between 18 and 25, roentgen therapy is the method of choice. It should be supported by an industrious search for and attention to any probable etiologic factors.

WHAT GOVERNMENT CONTROL OF MEDICINE MEANS

It spells the end of states' rights and makes possible the establishment of government by force and intimidation. It does not increase opportunities as some of the promise-everything politicians would have us believe. On the contrary, it lessens opportunities, for, instead of being free to conduct our personal affairs, we are subject to licensing and constant regulations, all according to the whims of the politicians in power.

History shows clearly that centralized political powers breed arrogance and despotism.

Society Proceedings

COOK COUNTY

CHICAGO MEDICAL SOCIETY

Regular Meeting Wednesday, February 5, 1936

SYPHILIS PROGRAM

Treatment of Congenital Syphilis..Harold Rosenbaum
Discussion—Alfred S. Traisman.
Treatment of Early Syphilis.....Oliver S. Ormsby
Discussion—Clark W. Finnerud.
Treatment of Syphilis of the Central Nervous System
.....George W. Hall
Discussion—Lewis J. Pollock, Ralph C. Hamill, and Francis J. Gerty.

Regular Meeting, Wednesday, February 12, 1936

GENITO-URINARY PROGRAM

Borderline Problems in Diagnostic Urology.....
..... Harry Culver
Discussion—Vincent J. O'Conor, Irvin S. Koll, Edward W. White, and Alfred E. Jones.
Bladder Tumors.....Joseph S. Eisenstadt
Discussion—Ben E. Fillis, and T. G. McDougall.
Transurethral Resection in Various Types of Bladder-neck Obstruction.....Herman L. Kretschmer
Discussion—Robert H. Herbst, Charles M. McKenna, and Harry C. Rolnick.

Regular Meeting, Wednesday, February 19, 1936

PROGRAM

Brucellosis .....
Wilburt C. Davison, Dean, Duke University School of Medicine, Durham, North Carolina
Hypoglycemic Reactions in Childhood.....
W. McKim Marriott, Dean, Washington University School of Medicine, St. Louis, Mo.
The Medical Citizen.....
Nathan V. Van Etten, Speaker, House of Delegates American Medical Association

Regular Meeting, Wednesday, March 4, 1936

ANESTHESIAS

We are fortunate in having as our guest speaker two outstanding writers and teachers on the use of anesthetics.

Inhalation Anesthesia
Volatile ether—Divinyl ether
Gaseous—nitrous oxide
ethylene
cyclopropane
Including intratracheal administration.....
Ralph M. Waters, M. D., Prof. of Anesthesia, Univ. of Wisc.
Intravenous—Evipol Sodium
Pantothal Sodium
Rectal—Colonic ether
Avertin
Regional Methods—Spinal
Sacral
Cervical
Preliminary medication for each agent and method will also be discussed..John S. Lundy, A. B., M. D. Prof, of Anesthesia, Mayo Foundation, Univ. of Minn. Graduate School.
Discussion—Arno B. Luckhardt and Isabella C. Herb.

Personals

Dr. Harry L. Huber addressed the Detroit Pediatric Society on February 5. His subject was "The Allergic Child."

Dr. Edwin W. Ryerson addressed the Peoria Medical Society February 18 on "Shoulder Disabilities" and "Causes of Low-Back Pain."

Dr. Joseph E. F. Laibe addressed the DeWitt County Medical Society on the subject of "Nephritis" at Clinton on February 17.

Dr. James H. Hutton addressed the Champaign County Medical Society on Thursday, February 13, on Glandular Therapy and Hypertension.

Dr. Frank B. Kelly gave a paper on "Etiology and Treatment of Pneumonia and Empyema" before the Will-Grundy County Medical Society on February 26.

Dr. William L. Beecher addressed the Chicago Society of Laboratory Technicians on February 20, subject "The Use of the Laboratory to the Allergist."

Dr. Wilber E. Post gave a paper on "Bright's Disease" before Will-Grundy County Medical Society on January 29.

Dr. John R. Harger spoke on "The General Practitioner and the Acute Abdomen" and Clarence A. Neymann on "Modern Concepts of the Classification of Nervous and Mental Diseases and Their Treatment" before Carroll County Medical Society on January 30.

Dr. Edwin W. Ryerson addressed the Staff of the Mayo Clinic, on January 30, on the subject of "The Development of the Surgery of Infantile Paralysis During the Last 35 Years."

Dr. M. Herbert Barker gave an address on "Pneumonia and Its Treatment," before the Winnebago County Medical Society, February 11.

Dr. Kellogg Speed, Chicago, discussed "Skull Fractures" before the Kankakee County Medical Society in Kankakee, February 20.

Dr. M. Herbert Barker, Chicago, discussed pneumonia before the Whiteside County Medical Society, January 23, in Sterling.

Dr. Frederick G. Dyas, Chicago, discussed goiter before the DuPage County Medical Society in Elmhurst, January 15.

Dr. Harry M. Richter Chicago, discussed surgical aspects of gallbladder disease before the Peoria City Medical Society, January 21.

Dr. Luke W. Hunt, Chicago, discussed "Scarlet Fever Immunization and Treatment" before the Kankakee County Medical Society, January 9.

Dr. Joseph Brennemann, Chicago, addressed the Sangamon County Medical Society, February 6, in Springfield, on "Pneumonias of Childhood."

At a meeting of the Perry County Medical Society in DuQuoin, February 6, Drs. Quitman U. Newell and Oswald P. J. Falk, St. Louis, discussed cancer and cardiovascular diseases.

Dr. Porter P. Vinson, Rochester, Minn., discussed "The Newer Findings in Pulmonary Disease With the Use of the Bronchoscope" before the Peoria City Medical Society, February 4.

At a meeting of the Adams County Medical Society in Quincy, February 10, Dr. Frank Smithies, Chicago, spoke on ulcerative lesions of the intestine.

Among others, Dr. Edward V. L. Brown addressed the Chicago Ophthalmological Society, February 17, on "The Apparent Increase of Hyperopia Before Nine Years of Age."

Dr. Owen H. Wangensteen, Minneapolis, discussed "Intestinal Obstruction" before the Englewood branch of the Chicago Medical Society, January 7.

The Springfield Medical Club, Springfield, will be addressed March 17 by Dr. Anton J. Carlson, Chicago, on "The Control of the Endocrine Glands."

Dr. William T. Coughlin, St. Louis, discussed "Cancer of the Breast" before the Macoupin and Montgomery county medical societies in January in Carlinville.

At a meeting of the Christian County Medical Society, January 30, Drs. Garwood C. Richardson and William B. Serbin, Chicago, discussed recent advances in obstetrics and obstetric hemorrhages, respectively.

Speakers at the quarterly meeting of the Henry County Medical Society in Cambridge, February 13, were Drs. Ford K. Hick and Charles M. McKenna, both of Chicago, on pneumonia and prostatitis, respectively.

A symposium on contact dermatitis was presented before the Chicago Society of Allergy, February 17, by Drs. Samuel J. Zakon, Chicago. Louis A. Brunsting, Rochester, Minn., and Carliss Malone Stroud, St. Louis.

The Chicago Roentgen Society was addressed, February 13, by Drs. Alfred E. Jones and Philip Rosenblum on "Foreign Bodies in the Genito-Urinary Tract," and Warren W. Furey, "Intestinal Obstruction as a Roentgenological Problem."

Dr. Frank L. Rector, Evanston, field representative of the American Society for the Control of Cancer, will in the near future conduct a survey of cancer in Illinois at the request of the Illinois State Medical Society.

Dr. Daniel H. Levinthal, Chicago, discussed "Treatment of Poliomyelitis in the Convalescent Stage" before the Bureau County Medical Society in Spring Valley, February 4; he also showed a motion picture on "Reconstruction Surgery for Residual Paralysis following Poliomyelitis."

Dr. Robert D. Schrock, Omaha, discussed "Treatment of Sprengel's Deformity" and "Immediate Bone Grafting Following Resection of Benign Bone Tumors" at a meeting of the Chicago Orthopedic Society, February 14. Dr. Samuel J. Lang discussed "The Mechanics of the Back and Its Relation to Backache."

Speakers before the Carroll County Medical Society, January 30, were Drs. John R. Harger and Clarence A. Neymann, Chicago, on "General Practitioner and the Acute Abdomen" and "Moddern Concepts of the Classication of Nervous and Mental Diseases and Their Treatment" respectively.

A joint meeting of the Chicago Tuberculosis Society and the Chicago Roentgen Society, January 9, was addressed by Drs. Robert S. Berghoff and Hollis E. Potter on "Diagnostic Value of X-Rays in Diseases of the Chest" and "Importance of the Caseous Lesion in Tuberculosis," respectively.

The Chicago Pathological Society was addressed, January 13, among others, by Dr. Harold R. Ostrander on "Multiple Heterogenous

Primary Malignant Tumors in One Host: Hypernephroma of the Kidney and Carcinoma of the Prostate."

At a meeting of the St. Clair County Medical Society in Belleville, February 5, Dr. Charles H. Eyermann, St. Louis, discussed "Allergy in General Practice," and Dr. Rolland L. Green, Peoria, president-elect, state medical society, February 6, in East St. Louis, social aspects of medicine.

At a meeting of the Chicago Pathological Society, February 10, Francis B. Gordon and Dan H. Campbell, department of bacteriology, University of Chicago, among others, were the speakers on "Active and Passive Immunity in Experimental Poliomyelitis" and "Antigenic Polysaccharides from Helminths," respectively.

Speakers before the Chicago Society of Internal Medicine, January 27, were Drs. Edmund F. Foley, Robert W. Keeton, Duane Darling and Aaron B. Kendrick, Ph.D., on "Alterations in Serum Proteins as an Index of Liver Failure"; Drs. William A. Brams and Jacob S. Golden, "Clinical Significance of Venous Pressure," and Carl A. Dragstedt, "An Experimental Study of the Mechanism of Anaphylaxis."

Dr. M. F. Engman, Jr., Washington University, St. Louis, addressed the Madison County Medical Society on the subject of "Eczema" February 7, 1936 at St. Elizabeth's Hospital, Granite City, Illinois.

News Notes

A. Abt professor of pediatrics, Northwestern University School of Medicine, has presented his library on the diseases of children, collected over a period of forty years, to Northwestern. The collection comprises 3,500 volumes and is valued at approximately $25,000.

Two evening clinics for women needing antepartum care were recently opened under the direction of the city health department. Free treatment will be given to women who work during the day. At the opening of the first clinic at 6312 Wentworth Avenue, nurses and physicians on the staff of the Chicago Lying-in Hospital conducted examinations and lectured on antepartum care.

The committee for mental hygiene of the Chicago Medical Society is arranging a special educational program on mental hygiene for lay persons. Radio talks, newspaper articles and addresses for parent-teacher meetings will be used, and arrangements have been made with Dr. Edward F. Dombrowski, managing officer of the Chicago State Hospital, to hold clinics for the branches of the Chicago Medical Society.

As part of a recently established plan to provide indigents and low income families in Peoria with more adequate medical service, newspapers report that the city hall has made available two rooms for the newly created Peoria Medical Clinic. Physicians of the city have agreed to give their services gratuitously through the clinic, which will be financed with appropriations from the Community Fund and county agencies. The Community Fund has stipulated that an executive committee of physicians and lay persons be established.

The council of the Chicago Medical Society, February 11, adopted a resolution endorsing Dr. Charles E. Humiston as candidate for president-elect of the American Medical Association. The resolution reads as follows:

Whereas, The Illinois State Medical Society through its Council by unanimous vote has endorsed Dr. Charles E. Humison as candidate for President-Elect of the American Medical Association and instructed its Delegates to urge his election at the Kansas City meeting; therefore be it

Resolved, By the Council of the Chicago Medical Society in regular meeting assembled, that said action of the Illinois State Medical Society in recognizing the superior qualifications of our distinguished fellow member for the high office of President of the American Medical Association be, and hereby is, commended, approved and endorsed.

The Chicago Society for the Control of Rheumatic Disease sponsored a symposium on chronic arthritis at the meeting of the Aux Plaines branch of the Chicago Medical Society, January 10. Speakers were Dr. Ralph Pemberton, professor of medicine, University of Pennsylvania Graduate School of Medicine, Philadelphia, on "The Medical Management of Chronic Arthritis," and Dr. Robert B. Osgood, professor of orthopedic surgery, emeritus, Harvard Medical School, Boston, "The Orthopedic Management of Chronic Arthritis." Dr. Ernest E. Irons, dean and clinical

professor of medicine, Rush Medical College, and Dr. John D. Ellis, associate in surgery, Northwestern University School of Medicine, discussed the papers.

As a part of an extensive building program at the Manteno State Hospital, Manteno, contracts have been let for twelve ward buildings, diagnostic building, hospital for the tuberculous, two hydrotherapy wards, mechanical building and two dormitories for employees. The total amount to be expended will be about $3,700,000, with contracts calling for completion of the work by December 15. Most of the buildings which were erected under this program last year at a cost of $1,900,000 are now occupied and include six ward buildings, hospital building store building and laundry. A general kitchen was completed, as well as the installation of mechanical equipment. With the additions, the bed capacity of the hospital has been increased by 1,600.

The March issue of the Radiologic Review & Mississippi Valley Medical Journal (Quincy, Ill.), is the ninth annual "Radium Number" of that publication. It is entirely devoted to Radium containing ten original articles, especially written for this issue by leading American Radium Therapists on various phases of Radium Therapy. There are contributions by Jones of Cleveland, Schreiner and Wehr of Buffalo, Soiland of Los Angeles, Murphy of Minneapolis, Fox of Dallas, Levin and Sittenfield of New York, Swanberg of Quincy, Simpson of Chicago, etc.

—Position Wanted: Male Technician—10 years experience, x-ray, laboratory and physiotherapy. Desires position with physician, hospital or clinic. Can Furnish own equipment. Salary or commission. Write L. T., care this Journal.

Deaths

Westley W. Halliburton, Alton, Ill.; Missouri Medical College, St. Louis, 1878, member of the Illinois State Medical Society; aged 84; died, Dec. 28, 1935, in St. Joseph's Hospital, of cerebral hemorrhage.

Henry Kent Hooker, Clinton, Ill.; Chicago Homeopathic Medical College, 1903; a Fellow, A. M. A.; served during the World War; for twelve years member of the high school board of education, and city physician; connected with the Edmonson Clinic; aged 60; on the staff of the John Warner Hospital, where he died, Nov. 21, 1935, following an operation for appendicitis.

Millard Hunter Fortney, Arcola, Ill.; Loyola University School of Medicine, Chicago, 1919; member of the Illinois State Medical Society; mayor; served during the World War; formerly school board trustee; aged 47; died, Dec. 1, 1935, of septicemia, which developed from an injury received in a fall.

George David Lockie, Springfield, Ill.; National Medical University, Chicago, 1898; member of the Illinois State Medical Society; veteran of the Spanish-American and World wars; aged 65; on the staff of St. John's Hospital, where he died, Dec. 25, 1935, of multiple sclerosis.

John Joseph McLaughlin, Chicago; Long Island College Hospital, Brooklyn, 1879; aged 77; died, Dec. 30, 1935, of myocarditis.

Silber Charles Peacock, Chicago; Rush Medical College, Chicago, 1925; a Fellow, A. M. M.; served during the World War; assistant attending physician at the Children's Memorial Hospital, and acting director of the Otho S. A. Sprague Memorial Institute Laboratory; head of the department of pediatrics, Henrotin Hospital; on the staff of the Ravenswood Hospital; aged 41; was found in his car murdered, January 3, after he had responded to a false telephone call to attend a sick child.

Stephen Roman Pietrowicz, Evanston, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1898; clinical professor of medicine, Loyola University School of Medicine, Chicago; at one time member of the school board; formerly superintendent of the Chicago State Hospital; fellow of the American College of Physicians; aged 62; chief of staff of St. Mary's of Nazareth Hospital, Chicago, where he died, January 12, of an abscess of the pancreas, diabetes mellitus and chronic nephritis.

Edward E. G. Weiland, Bloomington, Ill. (licensed in Illinois in 1895); aged 67; died, Dec. 14, 1935, as the result of injuries received in a fall.

George White, Chicago; Kentucky School of Medicine, Louisville, 1881; aged 80; died, Dec. 17, 1935, in the Roseland Community Hospital, of cerebral hemorrhage.

Francis A. Williams, Ritchey, Ill.; Columbus Medical College, 1891; aged 80; died, Dec. 4, 1935, of arteriosclerosis.

Ernest Elmer Wishard, Chicago; Medical College of Indiana, Indianapolis, 1900; aged 60; died, Nov. 27, 1935, of acute coronary artery occlusion.

Luther F. Worley, Mazon, Ill.; Missouri Medical College, St. Louis, 1887; aged 77; died, Nov. 22, 1935, of chronic myocarditis.

Harry Ralph Wormley, Rockford, Ill.; Rush Medical College, Chicago, 1906; a Fellow, A. M. A.; member of the American Academy of Ophthalmology and Oto-Laryngology; on the staff of the Rockford Hospital; aged 56; died suddenly, Nov. 20, 1935, of heart disease, while on a hunting trip in Iowa.

March, 1936

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